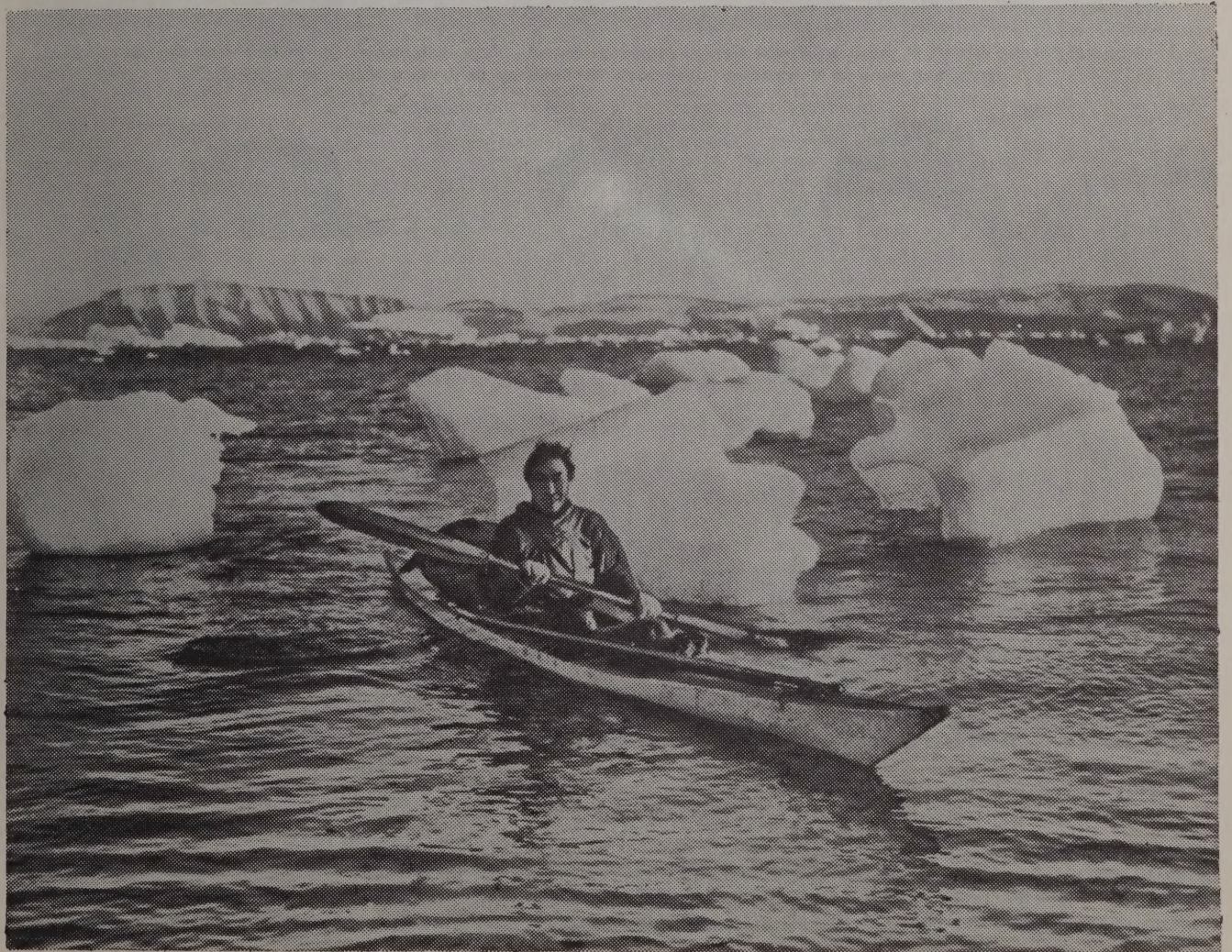
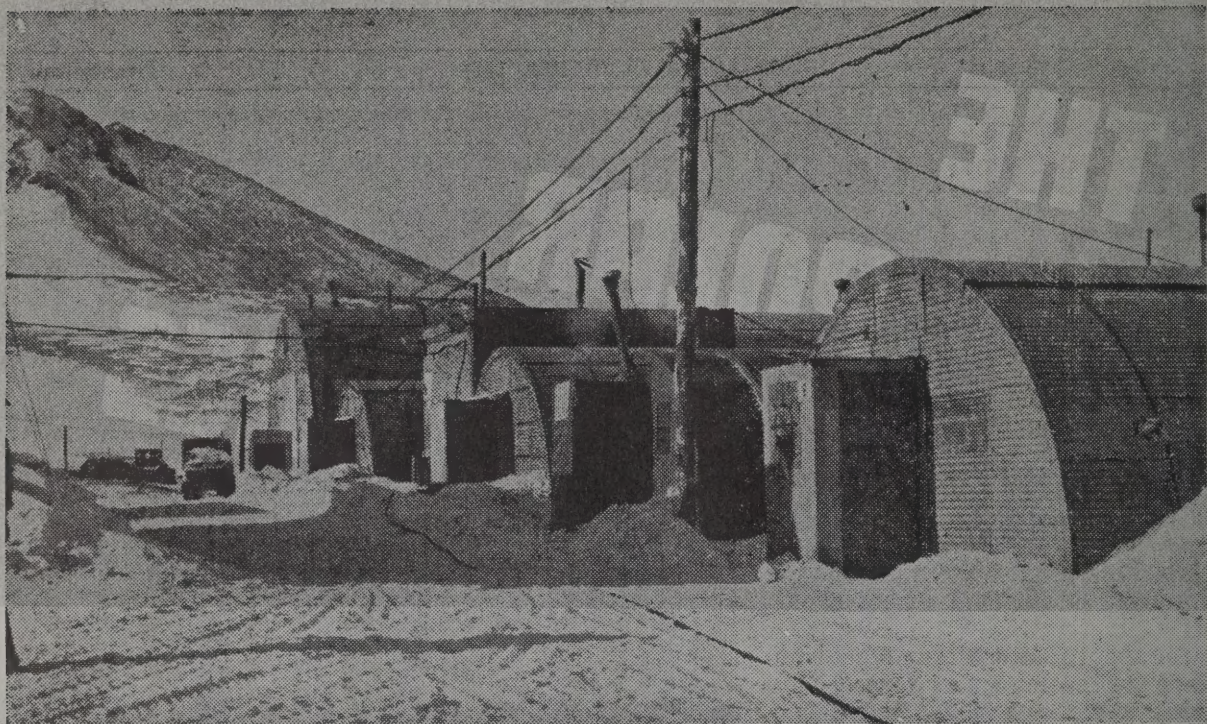


THE POLAR TIMES





A typical "street scene" at the Deep Freeze base at McMurdo Sound. Very little snow falls at McMurdo throughout the year, but snow is blown from other parts to build up in drifts against the buildings.



Biggest fish ever caught in the Antarctic--52 inches long and weighing 58 pounds -- is held by Stanford University Prof. Donald E. Wohlschlag for inspection by Philip M. Smith, senior U.S. Antarctic Research Program representative, and Rear Adm. David M. Tyree, commander of Operation Deepfreeze. Caught at McMurdo Sound, the big fish was taken away from a seal by USAHP biologists John Pearse of Stanford and William Fry of the University of the Pacific. Remains of an even larger fish--its tail and rear half weighed 94 pounds--have since been found on an ice floe, apparently left behind by an engorged seal. Largest fishes previously found alive by the biologists were only a foot or so long and skinny.

The Polar Times

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No. 53

DECEMBER 1961.

Antarctic Powers Confer

By Albert E. Norman

Australia-New Zealand Correspondent of
The Christian Science Monitor

Canberra

An historic step forward in development of peaceful pursuits in the world was seen in the first consultative meeting of the 12 signatories of the Antarctic Treaty, a landmark in world progress which will always be associated with President Eisenhower's administration, which did so much to establish it.

In opening this historic first meeting of Antarctic Treaty powers, Prime Minister Robert G. Menzies pointed out that four of them were nuclear powers.

"This is tremendously significant," said Mr. Menzies, "because the treaty itself and the whole spirit in which it was conceived have concentrated around three major principles which we would do well to bear in mind."

First of these, as established in the treaty, held "that it is in

the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord." The second, arising from the first, was the emphasis placed on cooperation, as Mr. Menzies declared.

Finally there was the freezing of the territorial status quo in Antarctica. Thereby the claimant nations, Argentina, Australia, Britain, Chile, France, New Zealand, Norway agreed to set aside arguments about territorial claims for more than 30 years. At the end of that period any treaty member may request a review of its operation.

In sharp contrast with current Soviet saber-rattling over Berlin and emphasis on increased Soviet defense spending was the assurance of Soviet delegation leader Ambassador Ivan Kurdiukov that the Soviet Government strongly supported the treaty pledge to maintain peaceful use

of Antarctica as a demilitarized non-nuclear zone.

Mr. Kurdiukov said the Soviet Union had strictly complied with treaty obligations it had undertaken in the Antarctic. "The Antarctic treaty," he said, "is a good example of the way in which, with good will and understanding, states may eventually reach agreement, meeting the interests of all mankind."

"The basic problem confronting mankind today is that of strengthening peace and of developing friendship and cooperation between all nations," he added.

United States Ambassador William J. Sebald, leader of the United States delegation, likewise emphasized strong support of the treaty pledge by the United States Government to maintain the Antarctic as a demilitarized nonnuclear zone.

"We hope for expansion of the programs for exchange of scientists under the treaty," said Mr. Sebald. "We also hope arrangements can be made for scientists from the countries represented here to join us at our stations and in our ships. We are prepared at all times to revise and modify our research program to include new ideas that appear most useful and interesting."

The American delegation leader also said his government expected that rights of inspection would be normal in the Antarctic. "We would not regard the exercise of these rights as necessarily indicating that there is a suspicion of activities contrary to the treaty," he explained.

The conference approved New Zealand resolutions to ask member governments to exchange information of plans for scientific programs, to promote continued exchange of scientists, and to make available all facilities for this purpose.

Observers agreed that if all 12 signatories approved the New Zealand resolutions one government could ask another direct for information on its Antarctic programs. The result could be to bring member governments closer together and promote international teamwork in the field.

This was one of the prime aims of the treaty, as Mr. Menzies explained.

At present such exchanges are made through various international committees.

Decision of consultative committee meetings, as provided by the Antarctic Treaty, must be unanimous. This means each

RIGHT OF INSPECTION IN ANTARCTIC CITED

CANBERRA, Australia, July 10 (AP)—The United States called today on the Soviet Union and other signers of the twelve-nation Antarctic Treaty to honor its provision for unlimited inspection of the continent to make sure that the pact is being observed.

United States Ambassador William J. Sebald called attention to the inspection clause as delegates from the twelve nations began their first treaty conference.

"We expect the exercise of inspection rights will be a normal activity," said Mr. Sebald. "The practice of inspection is the best way of assuring the absence of suspicion."

Soviet Ambassador Ivan Kurdiukov did not refer to the inspection clause specifically but declared that Russia had "strictly complied" with its international obligations in Antarctica.

The treaty provides, among other things, that the huge frozen continent shall be used only for peaceful purposes.

The two-week Antarctic conference will examine ways of facilitating exchange of scientific information and preservation of the continent's resources.

signatory has veto power which could be exercised by the smallest member. At the same time the treaty provided for reference of major disputes to the International Court of Justice, though this was not made mandatory.

Fantastic as it would perhaps seem to Scott Amundsen, and other early Antarctic explorers, the great white southern continent has become, through the Antarctic Treaty, a proving ground, as it were, for mankind's peaceful cooperative occupation and use of the moon and other territories in outer space.

As the only large region on earth where the world's major armed powers have agreed to work together disarmed and subject to the veto of the smallest member, the Antarctic represents the ideal stage which the world's peoples undoubtedly desire.

The day-to-day working pattern developed there could provide the peaceful pattern of cooperation not only for new territories in outer space but also for the world itself. Thus the Antarctic Treaty represents a big new opportunity for a fresh start internationally.

Antarctic Treaty Ratification Lauded

Washington

President Kennedy has expressed "profound satisfaction" on the coming into force of the Antarctic Treaty now ratified by all 12 countries which took part in the conference on Antarctica in Washington in 1959.

The President said in a statement issued at the White House that the treaty was a significant one in several respects and first and foremost it provided that the Antarctic continent shall be used only for peaceful purposes.

He said it contained an important provision under which the parties had a right to send observers anywhere in Antarctica at any time to see that the agreement was not being violated. He added, "It could very well provide valuable practical experience in the field of international inspection in other situations."

The President pointed out that the agreement also banned nuclear explosions throughout Antarctica, pending general international agreement on the subject, although the use of nu-

clear energy for such purposes as heat and power was permitted.

The President said, "the difficult question of territorial claims in Antarctica is in effect set aside by the treaty, which states that nothing in the treaty shall be interpreted as either a renunciation or recognition of claims or bases of claims."

Mr. Kennedy continued, "The United States has never asserted a territorial claim in Antarctica, nor has it ever recognized the claims of others. By this treaty the United States continues to reserve its rights throughout the whole of Antarctica."

He said he found it "very encouraging" that the treaty had been signed and ratified "by countries representing all of the world's six continents, many of which held divergent views on Antarctica."

He concluded: "I earnestly believe that the Antarctic Treaty represents a positive step in the direction of world-wide peace, and am genuinely gratified to announce its entry into force today."

ATOMIC DATA EXCHANGE

Members of Antarctic Pact to Provide Information

CANBERRA, Australia, July 17 (Reuters)—Delegates from the twelve member-countries of the Antarctic Treaty today agreed to exchange information on nuclear equipment and techniques to be used in the Antarctic.

The information probably will be exchanged through scientific pamphlets or conferences.

Such equipment includes a United States reactor, which will be installed to provide power for an American base and a Soviet nuclear-powered icebreaker.

RULES FOR ANTARCTIC

Parley Adopts Regulations on Living Resources There

CANBERRA, July 20—An Antarctic treaty conference here today adopted a set of rules designed to conserve living resources in the Antarctic.

The rules provide that indigenous animals and plants shall not be injured. Moreover, alien forms of flora and fauna shall not be deliberately introduced into the area, except under rigid controls and with due regard to their chance of survival and capacity to reproduce.

The rules also provide that dogs are not to be allowed to run free, that explosives and firearms are not to be used close to breeding colonies of birds and seals, and that these colonies are not to be disturbed by persistent attention from people on foot.

Another provision says that oil is not to be discharged from ships in a manner harmful to birds and animals.

Antarctic Meeting Set

CANBERRA, Australia, July 21—A twelve-nation Antarctic Treaty Conference decided today that its next meeting should be in Buenos Aires in about twelve months.

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

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Back issues are 50 cents each.

12-Country Pact in Effect In Antarctica

WASHINGTON, Oct. 28 (UPI)

Albert P. Crary, chief scientist of the U. S. Antarctic program, predicts international harmony and notable achievements in the Antarctic exploration season that now is starting.

This is the first season since ratification of the twelve-nation treaty for peaceful co-operation in Antarctica.

Meeting of treaty countries at Canberra, Australia, in July, and a later session of the Special Committee for Antarctic Research at Wellington, New Zealand, have established the basis for co-ordination and friendly co-operation during the first treaty year.

The United States and the Soviet Union again will exchange observers. American plans also call for increased co-operation with Argentina and Chile.

Mr. Crary said the U. S. program this year will emphasize geological and biological investigations because these sciences received relatively little attention during the International Geophysical Year program in 1957-58.

Another major objective will be advances in knowledge of upper atmospheric physics. A new U. S. project in 1962 will be a year-round meteorological operation at McMurdo Station.

A rocket project, to start in March, will seek to get atmospheric data to a height of thirty miles. Balloons heretofore used for such studies could ascend only fifteen to twenty miles. A Texas Western College unit will launch one or two rockets a month.

Mr. Crary speculated that 1962 scientific work of greatest interest to South American countries may be the geological explorations in the hinterland of the Bellingshausen Sea, along the southern base of the Palmer Peninsula and in the Ellsworth mountain range.

These explorations will go far toward determining the projection of the South American Andean mountain range into Antarctica.

They also will help determine whether the so-called Antarctic continent—beneath the great ice layer—may be an island archipelago rather than a solid mass of land above sea level.

Mr. Crary indicated that arrangements for co-operation of Argentine and U. S. scientists at the Ellsworth Station on the Weddell seacoast have not yet been completed.

Explorers Club Honor Given to Lowell Thomas

Lowell Thomas has been named honorary president of the Explorers Club, an organization composed of men involved in exploration and world travel.

Dr. Charles B. Hitchcock, president of the club, said Dec. 16 that the news commentator had been selected because of his wide travels, often to little explored lands.

Mr. Thomas is the fourth member of the club to be thus honored. The only other honorary presidents were Arctic explorers—Admiral Robert E. Peary, Gen. Adolphus W. Greely and Gen. David L. Brainard.

Mr. Crary said the United States has five scientists ready to go to Ellsworth Station when arrangements are completed. Four are weather experts and the fifth an auroral expert.

The Ellsworth Station, originally established by the United States during the International Geophysical Year, now is in the custody of Argentina.

The equipment includes cosmic ray instruments furnished by the University of California, ionospheric equipment furnished by the U. S. Bureau of Standards and some equipment from Dartmouth College. The equipment is operated by Argentine scientists but the data is analyzed by both Argentine and U. S. scientists.

Four geologists from the University of Wisconsin will co-operate with Chilean scientists this year, two more than last season. Chief investigator in the United States group will be Dr. Robert Dodd.

Two Chilean Antarctic scientists recently have received special training in the United States. One is an operator of a magnetic observatory. The other will study glaciology at the Videla base.

Mr. Crary believes that investigations of upper atmospheric physics in Antarctica are developing on a continuous basis, with many countries looking ahead to the international "Year of the Quiet Sun" in 1964-'65.

The International Geophysical Year was timed to coincide with the period of maximum sunspots. The "Year of the Quiet Sun" will be the period of minimum activity.

Norse Name for Spitsbergen

The Spitsbergen group of islands in the Arctic Ocean was called Svalbard by the Norse who discovered it in 1194.

ANTARCTIC PARLEY VOWS COOPERATION

CANBERRA, Australia, July 24 (AP)—The Antarctic Treaty Organization concluded a two-week meeting today with a communiqué announcing agreement on sixteen recommendations that will be presented to member governments.

Twelve nations, including the United States and the Soviet Union, took part in the discussions on the joint use of Antarctica for scientific purposes only.

The recommendations adopted unanimously included cooperation on scientific investigation, logistics, communications, conservation of living resources and preservation of historical sites.

The British delegate, Sir William Oliver, said the question of jurisdiction over persons in Antarctica had not been discussed because the delegates had been aware of the difficulties it raised. But, he said, "we believe governments cannot long delay in drawing up a formula for jurisdiction."

The Chilean delegate, Manuel Bianchi, said the first meeting of the organization "is the first proof that we can look to the future of the Antarctic treaty with optimism."

The other nations represented were Argentina, Australia, Belgium, France, Japan, New Zealand, Norway and South Africa.

American Polar Society

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Scientists Adrift on Arctic Isle Find a Flourishing Plant Life

**2-Mile-Wide Ice Sheet, Now Off Siberia,
Shows Signs Musk Oxen and Other
Animals Once Roamed Over It**

By WALTER SULLIVAN

There is an island far out in the Arctic Ocean dark with rocky hills, sprinkled with silt-floored lakes and, to the sharp-eyed botanist, green with eleven species of plant.

It bears evidence that musk oxen, lemmings and other continental animals have roamed across it. Nevertheless, it is afloat hundreds of miles off shore.

The island is a platter of ice some two miles in diameter and about seventy feet thick. It has been found that its hills are made of ice, covered by a rock mantle only a few feet deep.

The silt, sand and clay layer on the lake bottoms is less than half an inch thick. Chips of coal have been found among the scattered rocks.

Since its occupation by American scientists, last May, the island has drifted about 250 miles from the ice-clogged waters north of Alaska to the region north of Siberia. It has, in fact, reached a fork in the road.

Based on past drift observations it can be expected either to swing north and pass close to the Pole, or continue west toward the Soviet Union. Naturally the seventeen men encamped on the ice island, known as ARLIS II, hope it will go across the Pole.

The striking resemblance of the island to a land feature may explain a number of sightings reported by early explorers. The failure of subsequent visitors to find these islands has sometimes been used to discredit the work of the first-comers.

Thus "Crocker Land," which Admiral Robert E. Peary reported seeing on his journey toward the Pole in 1906, proved to be nonexistent. Frederick Cook in 1908 said he had crossed what seemed to be land-borne ice.

The Russians have reported finding islands. In 1931, Eskimos found and photographed "Takpuk Island" in the Beaufort Sea. None of this "land" has ever been seen again.

During the last summer ice-breakers of the United States Navy have made three efforts to resupply the ARLIS station.

On the first attempt, late in July, the Burton Island ran into extremely heavy ice. After loading supplies at Point Barrow, Alaska, she battled the ice for a week, but her rudder was

smashed. She then had to turn back.

A month later, after the summer sun had done its work on the pack ice, the Staten Island reached ARLIS II in seventeen hours. She unloaded 360 drums of Diesel oil and other petroleum products, as well as explosives and food—a total of 125 tons.

Thirty more drums on the island were filled from the ice-breaker's fuel tanks.

In early September the Staten Island made a second delivery. Hence, during an aerial inspection a few days ago, the station appeared all set for the winter night, which is at hand.

It is generally agreed that the island was originally part of a glacier that pushed out over the sea, possibly from Ellesmere Island, north of Canada. It then broke off and drifted away.

During the last summer the sun melted off some five and one-half feet of the surface. Assuming that this has been repeated for many years, the rocks picked up by the glacier have gradually become exposed.

In some places this process has produced a solid layer of boulders on the surface. One of them, crowning a hill, is twelve feet tall. This layer inhibited melting beneath it.

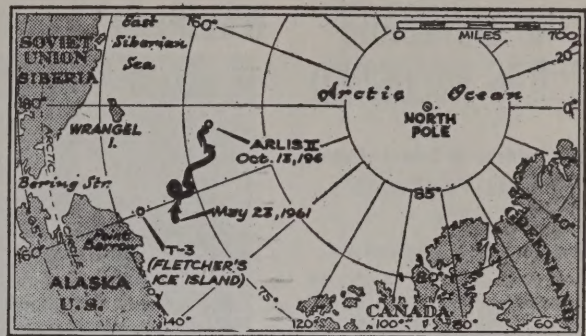
Less rocky areas near by continued to sink at some six feet a year and the more insulated ice remained to form the hills of today.

The drain hole later proved useful for the lowering of scientific instruments into the sea. It was found that the fresh water remained trapped under the island for five days, when high winds moved the island and apparently washed the water away.

The island has drifted as much as ten miles in a day and spins slowly as it drifts. The camp has huts housing the instruments normally used at polar stations for observing weather, radio propagation phenomena and other such things.

Oceanographic instruments have been lowered to depths greater than 6,500 feet. Oceanic life has been netted on the bottom and at predetermined depths. The propagation of sound through the ocean has been tested between ARLIS II, Alaska and T-3.

T-3 is a far larger ice island



The New York Times

Oct. 17, 1961

Dark line shows path of ARLIS II since its occupation in May. T-3 (Fletcher's Ice Island) is aground at the point shown after circling Arctic Ocean for a number of years.

Stranded Flyers Taken Off Ice Floe in Arctic

BARROW, Alaska, Nov. 18 (AP).—Thanksgiving, or something like it, came a week early for 11 men stranded beside their downed plane for two days on a small Arctic Ocean ice floe.

The group included nine search workers from the ARLIS II station of the Arctic research laboratory near the North Pole, and a pilot and co-pilot. They were picked up by a rescue plane yesterday and flown here.

With only about 2 hours of daylight in the Arctic this time of year, a ski-equipped Alaska National Guard plane, piloted by Maj. Dean L. Stringer, airlifted them at 12:10 p.m. (5:10 p.m., EST) yesterday.

They landed here at 3:32 p.m., all apparently in good

condition and uninjured. An accompanying aircraft went along as flying cover on the long round trip to the ice floe.

The ARLIS plane, a patrol craft on loan from the Navy, was forced down Wednesday night on a flight here because of a fuel mixup. Radioed reports said diesel oil had been pumped into the fuel tanks by mistake, and the plane made only about 30 miles before the engines fouled and stopped.

The craft was sighted from the air Thursday by a pilot who parachuted sleeping bags and other equipment. The weather at the research station was relatively warm yesterday, only one degree below zero.

that has been manned for a number of years by the United States Air Force.

Last week's inspection flight was arranged by the Office of Naval Research, whose Arctic Research Laboratory at Point Barrow set up the ARLIS II station. The name is an abbreviation of Arctic Research Laboratory Ice Station Number Two.

Its predecessor, ARLIS I, rode a thin ice floe 615 miles westward along the coast from north of the Mackenzie River to north of the Bering Sea. It was evacuated a year ago.

Eskimo to Serve in Malaya

WASHINGTON, Oct. 18 (UPI).—The Peace Corps is training a 30-year-old Eskimo nurse to work in semi-tropical Malaya early next year. Grace E. Lincoln, who was born and reared in the Arctic, is among the forty volunteers to be trained at Northern Illinois University at DeKalb.

ESKIMO CARVERS AIDED

**Enough Soapstone Is on Hand
for a Year's Work**

OTTAWA (Canadian Press).—The Northern Affairs Department believes it now has enough soapstone in the Arctic to keep Eskimo carvers working for a year.

It contracted to buy thirty-five tons of the soft stone from a Quebec company when usual Arctic supplies dried up. The Hudson's Bay Company had been providing some of the stone but found it unprofitable.

Many sources are an inconvenient distance from Eskimo settlements. R. A. J. Phillips, assistant director of the Northern Administration branch, said some supplies had come from Rankin Inlet on the west coast of Hudson Bay and also the east coast.

Eskimo carvings mean more than \$100,000 a year to the northern artists.

DYING LANGUAGE BEING RECORDED

Only 5 Persons Speak Eyak,
an Eskimo Dialect

By WALTER SULLIVAN

Only five persons who speak Eyak are known; hence, an effort is being made to record that Alaskan language on tape before it vanishes entirely.

The tongue is remarkable in that it apparently has no close relatives in the family of languages. Its decline appears to foretell the demise, within one generation, of many northern languages and dialects whose existence has depended upon isolation.

Such influences as the Eskimo-language broadcasts from Greenland and large modern schools have tended to dilute local dialects.

The disappearance of a dialect appears to be part of a trend that may lead eventually to the consolidation of the native cultures in the far north, and perhaps their assimilation into the white culture.

Eyak was the language of Indians in the Copper River area of Alaska. The five who still speak it live in Yakutat and Cordova. They range in age from a man more than 70 to a woman of 42. None except the 70-year-old is married to an Eyak; thus the five are believed to be of the last generation speaking that tongue.

Last summer Dr. Robert Austerlitz, assistant professor of linguistics and uralic studies at Columbia University, spent a month interviewing these survivors and making tape recordings of their speech. He believes it possible that Eyak stems from the same origin as the Athabaskan and Tlingit-Haida families of languages.

The Tlingit and Haida are seafaring Indians along the coast of southeast Alaska and British Columbia. The Athabaskans live in the interior. Other linguists have related Eyak to Eskimo. So far, Dr. Austerlitz has primarily recorded the Eyak vocabulary for plants and animals. He hopes, however, to return and continue the work.

At the University of Alaska, in the town of College, Dr. Michael Krauss has been recording the voices of those who speak the various Athabaskan languages of the Alaskan interior. Seven of these tongues, he said in a recent interview, are spoken by an average of only 300 people each.

One, known as Han, is used by only about sixty-five people, divided between Eagle, on the Yukon, and Moosehide, he said.

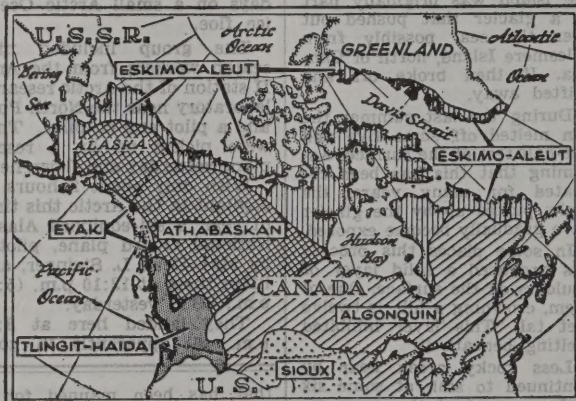
What makes the survival prospects of these languages

Northern Languages Are Vanishing



The New York Times (by Walter Sullivan)

Eskimo children in Barrow at northern tip of Alaska. Contact with white men, resulting from a desire to attend school, is causing rapid changes in Eskimo culture.



The New York Times

Oct. 26, 1961

The primary language groups in the north as charted by H. A. Gleason Jr. of the Hartford Seminar Foundation. Only five known speakers of the Eyak language remain.

particularly poor is that they have no literature of their own. However, each does have its folklore, its ethic and religion. Dr. Krauss fears that, if a particular language perishes before this material has been recorded, cultural features of special interest to anthropologists will be lost.

An important development in the Eskimo world during the last century has been the eastward shift of its population center. It is estimated that Greenland's population of 28,000 Eskimos represents roughly half the world's total of those people.

Formerly the greatest concentration of Eskimos was in southwest Alaska. They lived as far south as the St. Lawrence

River, but the Indians, being the first to acquire guns, drove them back into the more inhospitable regions of the north.

In recent years schools, in some cases as large and modern as any in the United States, have invaded the north. This, too, is having a profound influence. For example, the Federal School at Inuvik, by the mouth of the Mackenzie River, has 660 pupils in a town of 1,700.

The reason is that Eskimos from miles around are sending their children to the school in this newly built "capital" of the Canadian Northwest. The same is true of other centers, such as Barrow at the northern tip of Alaska. The Eskimo is by nature enterprising, and when his children are educated to the

ALASKA OIL QUEST GROWS IN PROMISE

Number of Producing Wells
Increasing Steadily

KENAI, Alaska, July 21 (AP)—A modern version of the historic Alaska gold rush is bringing another horde of hardy men to the mountains and arctic plains of the nation's forty-ninth state.

They are still searching—but this time it is for oil.

An intense search by geophysical and geological crews is now taking place along the barren Arctic slope, site of the Navy's Petroleum Reserve No. 4.

Pet 4, as it is called here, takes in some 15,000 acres of land at the top of the continent, in the Point-Barrow-Colville River-Mead River area along the north slope of the Brooks Range. The Navy says the reserve embraces five oil fields and two gas fields.

Geophysical and geological crews from thirteen major companies are scattered along the arctic slope from Barter Island, on Alaska's eastern border, to Point Hope, on the Chukchi Sea, a short skinboat ride from Soviet Siberia.

ALASKA TO HAIL CHURCH

Rites at Fort Yukon to Mark
Episcopalians Centennial

FORT YUKON, Alaska, July 1—Almost 1,000 visitors are expected at this village eight miles above the Arctic Circle to commemorate the centennial of the Protestant Episcopal Church in Alaska on July 3 and 4.

The Right Rev. Arthur S. Lichtenberger, presiding bishop of the church in the United States, will head the list of dignitaries attending the observances. He is now on a two-week tour of the forty-ninth state.

It was 100 years ago that the Rev. William West, an Anglican missionary from Canada, arrived at Fort Yukon. He traveled down the Porcupine River from the Northwest Territories.

Fort Yukon was established as a trading post of the Hudson Bay Company in what was then Russian America.

ways of the white man, he often does not wish to follow the way of life of his parents.

Despite the successful mixing, by some Eskimos, of the new with the traditional, the fact that there are only a little more than 50,000 of them in the world means that their future, as a cultural entity, is precarious.

ALASKAN STATION JOINS RADAR LINK

Post at Clear Is 2d on Duty
in Missile-Warning Net

At 11 A. M. Sept. 30, New York time, a technician threw a switch in the new ballistic-missile tracking station at Clear, Alaska.

Thus the second of three stations planned to give the West at least fifteen minutes warning if an intercontinental attack went into operation.

The first station is at Thule, Greenland.

The station at Clear had been on test, largely manual, since its completion on June 30. Yesterday it went on full automatic to extend the West's outer warning system by several thousand miles. When the third station, at Fylingdales, Yorkshire, England, is completed late next year all the areas from which an attack might come will be covered.

The Ballistic Missile Early Warning System has been described as the second largest project since the atomic bomb. Cost figures have not been divulged but are said to be close to \$1,000,000,000.

The system was devised and its construction directed by D. Brainerd Holmes, 40-year-old executive of the Radio Corporation of America. Last week he was named director of this company's manned expeditions into space and to the moon.

With two of the warning stations above or near the Arctic Circle, construction and operation presented an extremely difficult logistical problem.

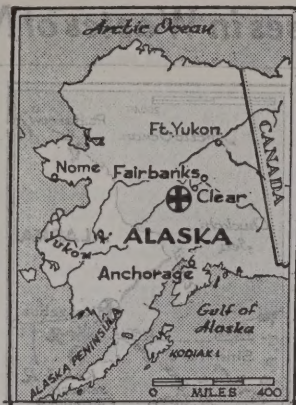
Delicate electronic instruments had to be transported thousands of miles by train, ship and air, at constant temperatures and protected against shocks that would interfere with their "memory" apparatus.

Up to date, almost 33,000 tons have been moved to the three sites, almost 3,000 tons by air. Also, 18,000 persons have been transported an average of 2,400 miles each by 1,300 aircraft, 168 seagoing vessels, 4,850 trucks and 2,370 railroad cars.

Among the special problems posed by the terrain at Thule and Clear was that of unfreezing the ground for the building and then refreezing it so the massive antennae and other structures would not settle out of plumb.

The center of the operation was at Moorestown, N. J., the headquarters of Radio Corporation of America, where Mr. Holmes had his office.

R. C. A. was the prime contractor of the project, as it is for operation of the three sta-



The New York Times Oct. 1, 1961
ALASKA ALERT: New missile tracking station (cross) put into operation.

tions. But it rained out sub-contracts to more than 2,900 American concerns, 2,600 of which employed fewer than 500 persons.

Many British companies also were involved. The Army Corps of Engineers supervised the design and construction of the buildings at the three sites.

The stations at Clear and Thule are under the control of the North American Air Defense Command of the United States Air Force with headquarters at Colorado Springs, Colo. The Yorkshire base will be operated under supervision of the British Royal Air Force.

A "blip" on the screen at any of the three stations, however, will be transmitted immediately to both American and British air defense control centers.

Contracts for design, installation and operation of the stations were awarded in January, 1958. Construction began later the same year. The Thule and Clear stations were completed on schedule; the Fylingdales station is behind schedule because of labor difficulties. It is hoped the lag will be overcome.

Engineers Will Ship A Slice of the Arctic

The New York Times,

CHICAGO, Sept. 4—Wednesday will be moving day for one of the strangest cargoes ever transported in the Chicago area, at least since the glaciers of the ice age passed here.

The shipment will consist of five tons of glacial ice, snow, ice crystals and permafrost, or frozen earth. It is stored now in a three-story building in suburban Wilmette.

The frozen matter, gathered from polar regions, will be moved along with other laboratory equipment to a new \$2,500,000 installation. This is now being prepared inside a site near Hanover, N. H.

ALASKA U. PLANS ARCTIC RESEARCH

Center Will Help Prepare
for Year of Quiet Sun

The New York Times,

FAIRBANKS, Alaska, July 29—America's northernmost university plans to establish an Arctic Research Center.

The center would unite the University of Alaska's various research programs and prepare the institution for participation in the International Year of the Quiet Sun, 1964-65.

An international research program similar to that of the recent International Geophysical Year will be carried on during the sun year. The university's Geophysical Institute is an international data center for the I. G. Y.

Quiet sun years, when auroral and other disturbances are at a minimum, come in eleven-year cycles.

Dr. C. T. Elvey, director of the ten-year-old Geophysical Institute, has been named the university's vice president for research and advanced studies. The position is new.

Dr. George Worthington Adams, head of the History Department at Southern Illinois University, Carbondale, has been named academic vice president.

Announcement of the two appointments was made by Dr. William R. Wood, who is completing his first year as president of the University of Alaska. Dr. Wood came here last year from the academic vice presidency of the University of Nevada at Reno.

"The proposed Arctic Research Center stems from an early interest in Arctic research by the university's staff and board of regents," Dr. Elvey said. "In 1932-33, the university was a major research station of the United States for the Second Polar Year and, of course, it took a most active part in the International Geophysical Year, 1957-58."

Dr. Elvey was a member of the national committee for the I. G. Y. He is a member of the International Committee for Geophysics, which is making plans for the sun year.

"The board of regents as early as 1936 passed a resolution offering the facilities of the university for cooperative programs in Arctic research," Dr. Elvey said. "Again during the past year, the regents have expressed their interest in cooperating with the Federal Government in pursuing research in the Arctic and sub-Arctic regions."

The university's current research program includes coop-

Tourist in Alaska Is Lost 10 Weeks Near Arctic Line

FAIRBANKS, Alaska, Aug. 28 (AP) — An emaciated tourist has survived ten weeks trying to find his way out of the sub-Arctic Alaska wilderness.

The tourist, William C. Waters, 42 years old, of Erlanger, Ky., was found Saturday by two moose hunters.

Mr. Waters, wasted to about ninety pounds from his usual 180, was brought to St. Joseph's Hospital here yesterday from Circle Hot Springs, about fifty miles below the Arctic Circle. Hospital attendants listed his condition as fair and his doctor said that he would recover.

His feet were swollen and had open sores, his clothes were in tatters, and his stomach was so shrunken that he could hardly eat when the hunters found him lying on the bank of Birch Creek. This was eighty miles from where he disappeared June 20.

Mr. Waters recalled only hazily what happened in the ten-week interval. He said that it had been like a dream in which he had stumbled across tundra and bog seeking civilization.

The state police said that Mr. Waters had driven to Alaska alone on vacation and had taken a side trip to the end of the Steese Highway at Circle, 120 miles northeast of here.

He left his car, hiked a few miles into Big Lake to fish and then decided to go on farther to try a stream near the foothills to the south. He never found the stream, but kept on until he got to Birch Creek.

eration with the United States Department of Agriculture in the operation of experimental farms at College, near Fairbanks, and at Palmer, in the Matanuska Valley.

At Point Barrow, the university operates the Arctic Research Laboratory in cooperation with the Office of Naval Research.

The university this year has created a Marine Institute for advanced research in fisheries. Dr. Kenneth Stephenson McFarlane Rae has been named the first director.

The last Alaska State Legislature authorized the university to establish a basic research program in business, economics and public administration.

Alaska Maneuvers Slated

WASHINGTON, Nov. 11 (AP) — About 8,000 Canadian and United States Army troops will participate in a midwinter field exercise in Alaska, the Army said yesterday. The exercise, called Great Bear, will be held in February.

ESKIMOS DEMAND HUNTING PRIVILEGE

Conference Calls on U.S. to Recognize Ancient Right

The New York Times.

BARROW, Alaska, Dec. 2— Eskimos of Alaska are organizing to protect their aboriginal hunting and fishing rights.

Village leaders from many parts of the state have drafted a statement of policy and recommendations after three days of discussion here. They called the attention of Congress and the Interior Department to the asserted need for prompt action in assuring the Eskimos their "Inupiat Paitot," or rights handed down by their ancestors.

These aboriginal rights, at the time Congress voted statehood in 1958, were seen by Alaskans as forming a difficult problem.

The conference of Eskimos noted that the aboriginal land and hunting rights of natives were recognized at the time Alaska was purchased by the United States from Russia.

"The United States said Congress would define these rights some day," a conference statement said. "The Alaska Statehood Act also says that the state may take over 100,000,000 acres from the public domain in twenty-five years. If Congress does not define our Inupiat rights soon, the twenty-five years will be up and our Inupiat Paitot will be gone. Congress should act now to settle our Alaska native claims."

The conference, of which Guy A. Okakok of Barrow was chairman, was sponsored by the Association on American Indian Affairs in New York. The association's executive director, Miss La Verne Madigan, attended the sessions. John Carver, Assistant Secretary of the Interior, also was present.

According to the Eskimos' statement: "Our Inupiat Paitot is our land around the whole Arctic world where we the Inupiat live, our right to hunt our food any place and time of year as it has always been, our right

to be great hunters and brave independent people, like our grandfathers, our right to the minerals that belong to us in the land we claim."

Nevertheless, Eskimo hunters found their hunting limited last year. Some found this out by being arrested by agents of the Fish and Wildlife Service when they shot eider ducks for food. The arrests were based on a migratory bird treaty with Canada and Mexico.

"Our right to hunt should not be subject to any international treaty without our consent," said he conference recommendations. "We ask the Interior Department to exempt us from

U.S. Hospital Rises in Wastes of Northern Alaska

By MARJORIE HUNTER

The New York Times.

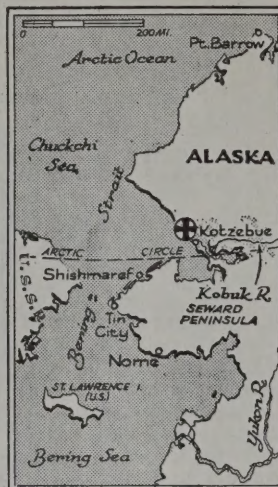
WASHINGTON, Nov. 4— A new hospital has risen in the wastes north of the Arctic Circle, an area where doctors often treat patients by two-way radio.

Dedication of the \$3,000,000 Public Health Service hospital this month will not silence the medical radio circuits. Alaska is too large an area to depend entirely on the few hospitals available.

But the new hospital, replacing old buildings and a quonset hut used for medical service, will help doctors in their stepped-up fight to control tuberculosis and other diseases that cause such high death rates among Eskimos and Indians in Alaska.

The fifty-bed hospital is at Kotzebue, thirty-two miles north of the Arctic Circle and only 150 miles across the Bering Strait from the borders of the Soviet Union. A few elderly Siberians living on islands in the Bering Strait crossed the ice and received outpatient treatment in the old quonset hut that the new hospital replaces.

The hospital will not be dedicated until Nov. 30, but some patients already have been moved in. A third of the thirty-four now there have tuberculo-



The New York Times Nov. 5, 1961
Site of hospital (cross)

sis. This is the leading cause of death in Alaska.

The Kotzebue hospital is one of seven maintained in Alaska by the Division of Indian Health of the Public Health Service. The division operates hospitals for both Indians and Eskimos.

The new hospital will serve 7,500 natives of Alaska, mostly Eskimos, in an area of 68,000

square miles containing twenty-eight villages. Many of the natives will never see the hospital, for there are no roads leading into Kotzebue. The only transportation is by airplane or dog sled.

Patients from outlying areas are flown into the hospital by bush pilots. Even this kind of transportation is cut off right now, for the ground is not frozen hard enough to support plane landings.

The medical radio treatment, used throughout the year, is effective even more during the thaw periods. Doctors at Kotzebue and at other hospitals set up radio communication each night with outlying villages.

Teachers, traders and missionaries outline disease symptoms of natives in the village. Doctors diagnose and prescribe treatment by the radios.

When severe cases are found, plans are made to transfer those patients to hospitals. Major treatment is done only at the Public Health Service hospital Anchorage.

Recently, Don Shelton, a bush pilot, radioed one of the Alaskan hospitals that his passenger was giving birth. He asked for medical instructions.

Minutes later, after getting instructions, the pilot reported on the newcomer: "He's kicking around and doing fine."

Alaska Natives Now Herd 43,000 Reindeer for Meat

MEKORYUK, Alaska.

Some 43,000 herded reindeer are giving Alaskan natives from Noatak to the Yukon-Kuskokwim delta a measure of economic stability they've never known before.

And a new experiment in marketing reindeer meat promises to bring reindeer herding up from a marginal to a profitable operation.

Under the Reindeer Act of 1937, the Federal government restricts the ownership of reindeer to native Alaskans.

Now, along the coasts of the Arctic Ocean and the Bering Sea and on desolate Nunivak Island, there are nineteen herds of reindeer, comprising approximately 43,000 animals.

Here at Mekoryuk on Nunivak Island, a modern slaughtering and refrigeration plant was constructed in 1944 to handle the 15,000 deer which graze on the island under the supervision of native herders.

Nunivak Island produced 150,000 pounds of reindeer meat

this year. About 90 per cent went to outlets in Alaska. The other 10 per cent was shipped south to the forty-eight states of the mainland.

Within the past few weeks, the Bureau of Indian Affairs negotiated a contract with a Seattle firm for the sale of 25,000 pounds of prime reindeer steaks.

The fresh-frozen steaks will be packaged in cellophane and flown to Seattle direct from Nunivak Island. The wholesaler will pay 40 cents a pound.

The Bureau of Indian Affairs, which keeps a tight watch on all reindeer operations, believes the reindeer meat will sell readily as a gourmet item at a price competitive with the better grades of beef, such as sirloin steak.

Of the nineteen reindeer herds tended by natives along Alaska's west coast, four are privately owned.

The largest herd, 5,000 animals, ranges in an area east of Nome under the watchful eye of owner Siegfried Aukongak.

ANCIENT CULTURE TRACED IN ALASKA

Excavations of Settlements
on Beaches Yielding Clues
Spanning 6,000 Years

By WALTER SULLIVAN

In the region where the Americas and Eurasia almost touch, a "guest book" has been found whose record seems to extend some 6,000 years into the past.

It shows that radically new ways of life appeared in North America during that period, but there is no evidence of great migrations from Asia.

Furthermore, the record indicates that, since the building of the Egyptian pyramids, there has been no period when the world was significantly warmer than today. Such warmth would have melted enough polar ice to raise ocean levels substantially, whereas the evidence on the Alaskan coast points to little change in the sea level.

The record there consists of a series of 114 parallel beaches, extending inland from the ocean at Cape Krusenstern, near the Bering Strait. Upon these beaches are the remains of a succession of civilizations that extend back thousands of years. As one walks the mile and a half from the ocean to an in-shore lagoon, each beach represents a more ancient period.

Unexpectedly, it has been found that the oldest of these cultures, the Denbigh flint complex, is the most sophisticated in workmanship and artistic freedom. Its flint arrowheads and knives are chipped so carefully that one needs a magnifying glass to appreciate the technique.

Dr. J. Louis Giddings, Professor of Anthropology at Brown University, who has been in charge of the excavation of some 300 sites at Cape Krusenstern, believes the Denbigh workmanship to be the most detailed of that found in any prehistoric flints. He puts the age of the culture at 5,000 to 7,000 years ago.

No satisfactory dating of its remains has been achieved by the radiocarbon technique. However, charcoal and wood found with the remains of a whaling culture on the fifty-third beach from that presently washed by the sea has been analyzed for radiocarbon. It was found to be about 3,700 years old. The Denbigh remains are on beaches 78 through 104 and presumably are from a culture proportionately older.

Beaches 105 through 114 are too swampy and too deep in sod for surface examination.

A Grim Fight for Life Is Shown in Old Ruins

The grim remains of a desperate fight for life 2,000 years ago have been found on an Alaskan beach.

In the charred ruins of a prehistoric house were the skeletons of a woman and two children. Near them were three bone-hafted adzes and it was evident that the three had been trying to burrow out of a hut whose overhead exit was impassable.

According to Eskimo legend, ancient raiding parties sometimes poured oil through the smoke hole in the roof, thus causing the cook-fire to flare up. The enemy would then club the occupants as they dashed out.

In this case, according to Dr. J. Louis Giddings of Brown University, the family apparently tried to dig another exit but suffocated in the attempt. The site was found at Cape Krusenstern last summer.

None of the beaches is more than about five feet higher than the present one, indicating no great changes in sea level. This, Dr. Giddings believes, may provide the long-sought "world standard" for determining sea levels during all periods up to 6,000 years ago.

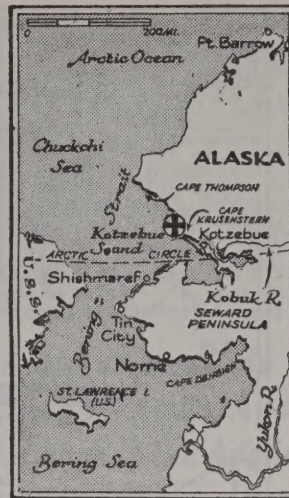
While ancient beaches have been found in many other areas, either their dates cannot be determined or the land level is thought to have changed. A primary cause of such changes have been the ice ages. Land heavily laden with ice may sink hundreds of feet, only to rise, century by century, after the ice has melted.

During the last great period of glaciation, the East Coast of the United States from the vicinity of New York northward was depressed by an ice load, but the coast of Alaska, near Cape Krusenstern, apparently was not.

Its oldest beach probably represents the ocean level at the end of the last ice age when melting had come to an end. All earlier beaches were wiped out by wave action as the oceans rose. Their total rise during the melting period is thought to have been more than 200 feet.

The excavation of sites on the Krusenstern beaches was described a few days ago by Dr. Giddings at the Haffenreffer Museum of the American Indian, in Bristol, R. I., of which he is director. The museum is affiliated with Brown, in near-by Providence.

The orderliness of the historical record at Cape Krusenstern derives from the fact that its residents, like the Eskimos of today, always lived directly on the water. The ocean was their source of food and their only highway, winter



The New York Times Oct. 30, 1961
Cape Krusenstern (cross)

or summer.

However a succession of beaches was formed, each a little further to seaward. Some beaches are fifteen miles long. Dr. Giddings believes they were built by the combined effect of wave action and small, cyclic changes in sea level. Each of the 114 beaches has probably supported human habitation, he thinks, although beaches 54 through 77 are comparatively thin in sites.

This may have been because food, in that period, was scarce along this part of the coast.

Altogether eight distinct cultures have been identified in the beach sequence, plus an even more ancient one atop palisade-like cliffs further inland. The latter, Dr. Giddings thinks, may have flourished during the last ice age, when so much water had been removed from the oceans that an isthmus 600 miles wide linked Alaska and Siberia.

The Krusenstern site was discovered in 1958 and has been dug the past three summers. While the discoveries show no evidence of migrations, they suggest that ideas flowed into North America via this route. Thus the Denbigh culture used bows and arrows, whereas such weapons reportedly were not adopted in the land of the Indians of the Great Lakes area for another 4,000 years or more.

Presumably the Americas were populated when the land bridge across Bering Strait was broad and livable. Dr. Giddings objects to the idea of "migration." He believes the spread of population was by a diffusion process that took thousands of years and involved no willful movements of substantial distances.

The great antiquity of the entry of man into the Americas, and his subsequent isolation, are shown, Dr. Giddings points out, by the total absence of any clear link between the languages native to the Americas and those of Eurasia.

ICE PACK TO ESKIMO MEANS 'SAFE HARBOR'

NOME, Alaska (Reuters)—Some forty King Island Eskimo families, homesick for their bleak ancestral Bering Sea home, have been watching the thickening Bering Sea ice pack with growing satisfaction.

Winter's ice and snow, paradoxically, make a livelihood possible on the lonely, rocky island, which lies thirty-five miles off Alaska's Seward Peninsula, close to the International Date-line.

With no streams, springs or wells on the island, winter snow and ice provide fresh water. The ice pack also makes it possible to fish and hunt walrus—the all-purpose mammal on which the Eskimo depends.

Despite the precarious and sometimes dangerous existence chopped out of the winter ice and snow, the King Islanders happily leave the mainland each year and trek home when the thick rind of ice forms over the Bering Sea.

Italian Team Climbs Tough Alaska Peak

ANCHORAGE, Alaska, July 25 (AP).—A six-man Italian team was reported today to have conquered 20,320-foot Mt. McKinley, climbing up the previously unclimbed sheer south face of North America's loftiest peak.

The feat was hailed by Bradford Washburn, director of the Boston Museum of Science and a recognized authority on Mt. McKinley, as "the greatest achievement in American mountaineering history." Mr. Washburn was notified of the ascent by telegram in Boston.

A member of the expedition, Gian Canali, told of the conquest when he was flown here last night for treatment of severely frostbitten feet. Mr. Canali said the party, led by Riccardo Cassin, fifty-three, of the Lecco Chapter of the Italian Alpine Club, fought its way to the summit July 19. He said several other members of the team were also suffering from frostbite.

Mr. Canali was brought to Anchorage by a bush pilot who planned to return immediately to the mountain to evacuate the other climbers.

Barren Area in Canada

Canada's Northwest Territories covers a third the area of the United States. Yet the region has only 23,000 inhabitants. Lone trading posts in the Territories receive supplies once a year by means of "cat swings," treks made by tractors pulling sleds.

CANADA EXPANDS ARCTIC EXPLORING

3 Expeditions Study Diverse Subjects in Archipelago

By WALTER SULLIVAN

Convinced that its future prosperity or decline depends in large measure on what happens in the Far North, Canada has embarked upon a many-faceted exploration of that region.

Three expeditions are working this summer in the islands of the Canadian Arctic Archipelago. Several of the islands are larger than New York State, yet large sections of them have been visited only by Eskimos.

The studies pertain to subjects as diverse as the flight path of ballistic missiles and the chances of radical climate change in the near future. An important goal is to learn what natural resources lie in this region, not only on land, but also on the shallow continental shelf that reaches northward eighty-five miles from the islands.

Evidence has already been found suggesting oil deposits and other forms of mineral wealth. The Canadian Government believes the Soviet Union and the United States know more about the shelf area than does Canada herself. This has, in fact, been used as justification for the large-scale effort now under way.

The Soviet Union has been systematically studying the entire Arctic Basin by landing parties on the drifting ice with small planes.

According to Soviet scientific reports at least a dozen of these landings have been within 200 miles of the Canadian islands.

According to the Canadian Government a far greater knowledge of the Arctic is needed if the country's transport system is to be developed in an intelligent manner. It is particularly important to know where the resources lie and which areas may become habitable—or may become uninhabitable.

The expeditions in the Canadian Arctic are moving by boat, dog team, helicopter and in small planes fitted with gigantic balloon tires. The latter have enabled survey teams to land on lumpy, swampy tundra or on rocky terrain.

One of the three expeditions is a Canadian-American venture in that it is sponsored by the Arctic Institute of North America, which operates jointly in the two countries. The expedition leader is Spencer Apol-

onio, a marine biologist from Yale University, and its twenty members have been recruited from five nations.

Its base is on the north coast of Devon Island, opposite the south shore of Ellesmere Island, whose glaciers dump icebergs, boulders, gravel and rock flour into the sea. One of Mr. Apolonio's objectives is to see if this discharge of minerals into Jones Sound makes for a richer oceanic flora.

Some suspect that glaciers play an important role in making the sea fertile in some parts of the polar regions and not in others. Thus in Antarctica, for example, the waters off one part of the coast may be crystal clear, whereas elsewhere they are murky with plant and animal life.

Devon Island is 300 miles long and is uninhabited. Last year, however, while the expedition was establishing its main base, its archaeologists found the sites of two ancient Eskimo villages. They were attributed to the Dorset and Thule cultures, and also, possibly, to the pre-Dorset period.

The program for this summer calls for observations from a station atop the island's 6,000-foot ice cap. The only important ice sheets in the Canadian Arctic are on the islands near Baffin Bay and Davis Strait, which together form the sea lying between the islands and Greenland.

Moist winds blowing in from this sea deposit more snow on the high land of these islands than can melt the following summer, which is the essential condition for the creation of an ice cap.

Farther west the islands are dry and barren. Preliminary reports suggest that those nearest

the North Pole were not covered with ice, even when the successive ice sheets of the Glacial Epoch crept down over the northern United States.

If so, this would cast some doubt on the hypothesis that these ice ages developed when the Arctic Ocean was ice-free and therefore a generator of moist winds. If this was the case, one would expect the northern islands of Canada to have been glaciated.

Since the ice cover of the Arctic Ocean appears to have thinned considerably in recent decades, the question is not entirely academic. Some of the ice-cap studies are directed to the inter-relationship between glacier growth and various climatic factors.

The Polar Continental Shelf Project, whose field leader is Dr. E. Frederick Roots, placed a research station on the summit of the small Melghen Island ice cap in 1959 and is continuing to study what appears to be the westernmost mass of ice in the islands. Dr. Roots, a geologist, has explored in both polar regions.

The third expedition, on Axel Heiberg Island, is sponsored jointly by McGill University in Montreal and Dr. George Jacobsen, who was with the party that, in 1953, made the first penetration of the island's interior. The leader in the field is Dr. Fritz Mueller, a Swiss scientist and alpinist who is now with McGill.

It is this expedition that has been using a Piper Supercub equipped with balloon tires to ferry supplies from the airstrip at Eureka weather station, on Ellesmere Island, to the camp sites. It is said that the plane can land on any terrain that is not so soft that a man's foot sinks in and that it can take off in seventy-five feet or less.

In one case it has landed on frost-heaved stones whose up-ended points were almost razor-sharp. It has proved far more economical than the more complex helicopters.

The expedition's objectives are to study the past history of the island as evidenced in its plants, its rocks, its ice and the signs of erosion by ice and water. Peat beds in some cases ten feet thick have been found and radiocarbon dating has shown them to be some 4,000 years old.

This and other evidence suggests that the ice cover is as great today as it has been in several thousand years. One of the approaches has been to examine the lichens, or paper-like plants, adhering to rocks on the heaps of rock, or moraines, left by earlier glacier advances.

This was done in part by Dr. Roland E. Beschel, formerly of the University of Innsbruck in Austria and now at Queen's University in Kingston, Ont. His statistical study of lichens clinging to Viking tombstones in southwest Greenland has convinced him that these plants, usually the size of a 50-cent piece or a demitasse saucer, take perhaps 1,000 years or more to reach full maturity.

The sizes of these lichens on the moraines suggested that they have been free of ice since the years when ice still covered many areas much farther south.

For its ice studies the expedition on Axel Heiberg has established two stations, 725 and 5,600 feet above sea level. The project began with a reconnaissance in 1959, followed by full-



The New York Times

July 9, 1961

ARCTIC PROJECTS: The Canadian Government's Polar Continental Shelf Project is centered at Isachsen weather station on Ellef Ringnes Island (1). The Devon Island expedition is based on the north coast of that island (2) and the Jacobsen-McGill Expedition is on Axel Heiberg Island (3).

scale studies last year and this. It is expected to operate on a lesser scale next year.

The Arctic Institute hopes that the main station on Devon Island will continue for a number of years to serve as headquarters for various research activities in the area.

The center of activity for the shelf project is at the Isachsen weather station on Ellef Ringness Island. There a Decca master station has been installed, with sub stations on Meighen and Borden Islands. These are the British equivalent of the American Loran radio-navigation system.

These stations enable photographic planes, surveyors on land, and hydrographic boats to determine their positions with great accuracy. A special effort is being made to survey the island channels to determine which might be open to submarine penetration when frozen over. It has been found that some of the deep channels between the islands extend out across the shelf to where it drops abruptly to mid-ocean depths, some eighty-five miles north of the islands.

Among the many scientific surveys being conducted are those of the earth's magnetism and its varying gravity. Since the flight path of a missile is controlled by gravity, aberrations in that force are of military significance, as well as being clues to the nature of the earth's crust.

On Axel Heiberg and elsewhere geologists have found the gypsum domes that make the hearts of oil prospectors beat faster. Preparations are being made to drill a hole some 2,000 feet deep on that island, both to study its geology and to see how deep the temperature remains below freezing.

The plan for next year is to move the operating area of the shelf project from the region surrounding Ellef Ringnes Island to the southwest. The Decca system will be relocated accordingly.

ATOM STATION SHIPPED

Weather Facility to Be Set Up on Island in Arctic

MONTREAL, July 26 (Canadian Press)—The Canadian ice-breaker John A. MacDonald sailed for the Arctic today with the world's first atomic-powered weather station on board.

The station, fully automatic, is to be established on Graham Island. Containing an automatic recording and transmitting unit, it was built by the Glenn L. Martin Company of Baltimore under contract with the United States Atomic Energy Commission.

The station is designed to collect and relay data on temperature, wind and barometric

CANADA BUILDING NEW ARCTIC TOWN

Inuvik, Called a 'Gamble on Stilts,' Looks Far Ahead

INUVIK, Northwest Territories (Canadian Press)—"The place of man"—Inuvik—perches on the Arctic frontier, a pastel-tinted portent of a new north. It is a gamble on stilts.

Function: administrative center for the northwestern end of the Northwest Territories; springboard for development by private enterprise that the government hopes will follow.

Main objective: educational training for rising generations of Indian, Eskimo and other youngsters to take part in future resources development.

Location: 200 miles north of the Arctic Circle.

Inuvik, population about 1,500, was started in 1955 by the Liberals to replace the old fur center of Aklavik and it was finished by the Progressive Conservatives. It was officially opened by Prime Minister John Diefenbaker recently.

It has been criticized, largely on the ground that it represents federal extravagance in its 100-bed hospital, 700-pupil school, airstrip, homes, offices and hostels for children from up to 1,000 miles away.

Is it premature? Will private enterprise follow the trail blazed by government, creating jobs for youngsters trained away from the subsistence-level industry of hunting and trapping?

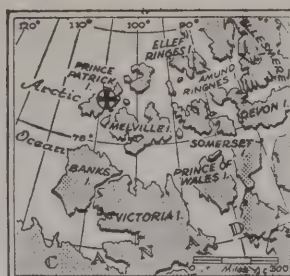
Will it last in the permafrost. Has the gaily-painted community a built-in segregation hazard with its tent village and smaller government-built homes for Indians and Eskimos?

Some northern planners agree that there may be a puzzling and confusing fifteen years ahead for the first products of a federal school system begun only in 1949. But by 1980, forecasts indicate, there may be 10,000 jobs supplied in the Northwest Territories from petroleum.

Officials say its buildings are planned to last 100 years. They are of wood—for lightness—

pressure. It will fill a gap in the meteorological network between outposts at Resolute Bay on Cornwallis Island to the south and Eureka on Ellesmere Island to the north.

The station's atomic generator, powered by strontium 90, is expected to operate for several years without maintenance or refueling.



The New York Times
AUG. 9, 1961
Locale of discovery (cross)

A Stefansson Note Left 46 Years Ago Found in the Arctic

The New York Times.

OTTAWA, Aug. 8—A note left by the Arctic explorer Vilhjalmur Stefansson forty-six years ago on an unnamed island in the Far North has been found by a Canadian surveying team.

The note, according to the Department of Mines and Technical Surveys, was in a tea can that had been tucked into a cocoa tin and placed at the bottom of a small stone cairn by Mr. Stefansson and his party. The note was found on a small island off remote Prince Patrick Island.

The note, written in ink and dated June 14, 1915, reported the explorers' position and their plans.

The explorer and his team were members of the first Arctic expedition sponsored by Canada nearly half a century ago. Mr. Stefansson, at 81, is recognized as one of the world's leading Arctic authorities.

and they squat on wooden piles driven into the steam-thawed permafrost and frozen there. The piling is fenced, partly to prevent any surface disturbance like weight or heat that would cause underground buckling and heaving.

The \$6,000,000 airstrip is insulated with eight feet of crushed rock, a scarce commodity. The fire hazard is recognized in the wide spacing of buildings, in fire doors and the hospital sprinkler system.

Snaking through town to each building in the main section is the utilidor, the aluminum-sheathed, all-weather conveyer for the central heating, sewage and water pipes. It looks like a windowless version of the Canadian Pacific Railways' transcontinental, head high on its own stilt system.

Gold Rush Up North

Edmonton, Alta., Dec. 19 (AP).—A claim-staking rush has following a gold find in the Northwest Territories, 275 miles northeast of Yellowknife. The

ARCTIC ICE ATLAS ISSUED BY CANADA

English Producer Consulted Logs of 248 Ships

OTTAWA (Canadian Press)—Four years of dedicated work by Charles Swithinbank, an Englishman, have produced an ice atlas of Canada's arctic islands.

The work, which included examination of the logs of 248 ships dating back to 1900, was carried out at the Scott Polar Research Institute in Cambridge, England, under contract of the Canadian Defense Research Board.

The first copy of the atlas was made available to the Canadian Transport Department, and on the basis of the information in it the department immediately rescheduled its northern supply run in Foxe Basin.

The atlas will be of inestimable value to any organization planning arctic sea voyages because it gives a week-by-week synthesis of ice conditions throughout the arctic navigation season as observed during the last sixty years.

Mr. Swithinbank, now at the University of Michigan, not only pored over old ships' logs but consulted hundreds of maps, charts, textbooks and reference works and visited such places as the whaling museum at New Bedford, Mass.

The resulting atlas was produced by the Federal Department of Mines and Technical Surveys.

The atlas presents an ice map for each week between May 1 and Oct. 31. There are also semi-monthly or monthly charts for the other months except December, January and February, when navigation is impossible.

Each map shows small circles covering the entire water area of the arctic islands. Colors depict open water or ice conditions.

A number records the number of years observations have been made in each location. Another small insignia give the type of ship that encountered the recorded ice conditions.

Consequently, a mariner can judge fairly accurately what ice conditions he will encounter anywhere in the arctic islands.

The period of observation will enable him to estimate the reliability of the charted conditions. He will also know what strength hull he will need to meet the listed conditions.

last important gold discovery in Canada was in 1935 near Yellowknife, 650 miles north of Edmonton.

Weather Eye in Arctic Is Atomic



The New York Times

Oct. 16, 1961

Atomic-powered and satellite-observing stations are joining frontier weather posts that span Arctic. Atomic station on Axel Heiberg Island transmit observations to Resolute Bay, where preparations are being made to record signals from Topside satellite. At Gilmore Creek, cloud pictures from the Nimbus satellites will be recorded.

Satellite to Transmit Polar Pictures to Post in Alaska

By WALTER SULLIVAN
The New York Times

FAIRBANKS, Alaska, Oct. 11—Across the Arctic from Greenland to Bering Strait, weather reporting is making a dramatic leap from frontier conditions to the sophisticated use of nuclear and space technology.

This development is of concern to all who live in North America, for events in the Arctic atmosphere play an important, if not a controlling, role in the generation of weather over Canada and the United States.

At Gilmore Creek, fifteen miles north of here, a great eighty-five-foot dish antenna has been set up to receive pictures of polar weather from the Nimbus satellites. The first of this new family of weather-observing vehicles is to be launched about next March.

On Axel Heiberg Island, far beyond the frontiers of North American civilization, an unmanned, atomic-powered weather station has been operating for the last eight weeks. Its reports, sent every three hours, are recorded by a manned station at Resolute Bay on Cornwallis Island, 300 miles to the south.

Cornwallis is a low, treeless hump of rock and gravel, al-

most as large as Connecticut. Inhabited by a few musk oxen, polar bears and Arctic foxes, it already is deep in the polar winter.

Special equipment is being installed at the ionosphere station set up there by the Canadian Department of Transport. Its task will be to send radio signals up through the ionosphere to be recorded by the so-called Topside satellite, also due to be launched next spring.

Although this satellite will be placed in orbit by the United States, it will carry a Canadian experiment. The objective is to study the electrified, or ionized, regions of the upper atmosphere (the ionosphere) by recording the intensities of radio signals on various frequencies after they have passed outward.

The observed intensities on frequencies from 1.5 to 20 megacycles will then be reported by the satellite and recorded at Resolute. A number of other stations in the Americas, the Far East and elsewhere will make similar observations.

Hitherto the only way to observe radio signals passing through the entire atmosphere was by listening to the radio "noise" coming from the stars, a technique of limited precision. The satellite will carry antennas of furled metal tape that, upon release, will spring out to a length of seventy feet on either side.

The extension of weather maps into the far north has been possible for little more than a decade, following completion of a skeletal network of stations. The network extends from Nord, established with the aid

Nuclear Installation, Unmanned, Placed on Remote Island

of the United States Air Force and Weather Bureau at the northeast tip of Greenland, to Point Barrow on the northeast coast of Alaska.

The most northerly land station in the world is the one at Alert, on Ellesmere Island. It was during the establishment of that outpost, in 1950, that Charles J. Hubbard, head of the Arctic Operations Project of the United States Weather Bureau, lost his life.

He was one of many specialists who perished in plane crashes that occurred under the primitive flying conditions of that region.

During the last two weeks his successor, J. Glenn Dyer, has toured the area with a party of polar specialists.

Wrecked planes could still be seen on the treeless landscape. Now fine air strips have replaced the frozen lakes and other makeshift landing facilities used when these stations were being set up.

Conditions at times have been grim at stations lacking an air strip suitable for heavy planes. The two men at one outpost, for example, resigned their career jobs rather than remain. By radio they chartered a small plane to lift them out.

The reason for their distress was that the annual relief ship had been unable to reach them because of ice and had left their

supplies some thirty miles up the coast.

Most of the stations on the northern fringes of the weather net are on Canadian islands remarkable for their starkness and immense size.

In addition to Resolute and Alert, these consist of Sachs Harbour on Banks Island, Mould Bay on Prince Patrick Island, Eureka half way down the great length of Ellesmere Island and Isachsen on Ellef Ringnes Island. Ellesmere is roughly the size of Florida.

The establishment, maintenance and operation of these remote stations has been possible only because of continuous co-operation between the Weather Bureau and Canadian agencies, particularly the Royal Canadian Air Force. Canada now operates the station at Sachs Harbor and Denmark runs the Nord station.

The rest are jointly operated by the United States Weather Bureau and the Canadian Meteorological Services.

The network is still very thin compared to the coverage of areas further south. It ends at the northern limits of the land except for the two or three stations maintained on drifting ice of the Arctic Ocean by the United States and the Soviet Union. Hence the special interest here in weather satellites and in atomic-powered surface stations.

The station set up on the southern tip of Axel Heiberg Island is powered by electricity generated by heat from the radioactive decay of strontium 90. It is designed to operate two years or more without servicing.

Its transmissions every three hours resound from the radio receivers at the Resolution weather station like the coded beeps from a satellite. They report barometric pressure, temperature, wind speed and direction all in seven seconds.

The remote station cost some \$800,000 to build. But it is thought, if such stations and their strontium 90 fuel were mass produced, the price could be cut radically. This would give the Atomic Energy Commission an outlet for the strontium 90 by-product of some of its production operations.

This radioactive isotope is one of the more hazardous components of fall-out because it tends to become incorporated into bone tissue. The strontium 90 fuel cells are designed to avert escape of the substance no matter how roughly they may be treated.

No decision on making more of these remote stations is expected until after the present one has gone through a two-year trial.

Polar Bear Cubs Tiny

While a mother polar bear weighs upwards of 700 pounds, her cubs weigh less than two pounds at birth and are only about 10 inches long.

Bit of Russia Drifts Into Canadian Arctic

Twisting Path Taken by Floe on Voyage of 1,200 Miles

By WALTER SULLIVAN

A little bit of Russia has drifted into a North American bay.

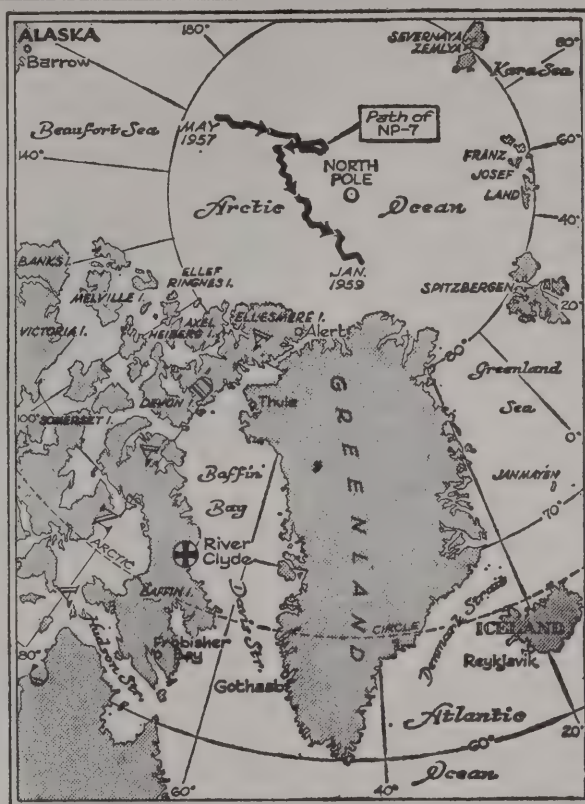
As though guided by some mysterious pilot, the ice floe bearing North Pole 7, an abandoned Soviet scientific station, has threaded its way among the Arctic islands to a point off the east coast of Canada's Baffin Island.

The camp was spotted last May by a search-and-rescue plane of the Royal Canadian Air Force. Its installations were visited by two Canadian scientists, but no announcement was made, pending notification of the Russians. The latter have now acknowledged receipt of the information.

When found by the Canadians, the camp had covered a straight-line distance of some 1,200 miles since the Russians abandoned it in March, 1959. How the station, with its tents and buildings, sailed so far without being observed is a puzzle. During the last summer the ice of Baffin Bay has dispersed and largely melted.

The most probable route of the floe was down the narrow straight between Greenland and Ellesmere Island, passing close to the Alert weather station and the United States Air Force Base at Thule. However, it is possible that it sailed all the way around the east coast of Greenland.

Prevailing winds and currents carry ice down the east coast of that great island and some of it presses around the southern tip into Baffin Bay. However, to reach Clyde River Inlet, North Pole 7 would have had to sail more than 1,000 miles north up that bay. This some



The New York Times

Oct. 22, 1961

SOVIET WANDERER: An abandoned Russian scientific station, on an ice floe, has drifted deep into Baffin Bay and been visited about thirty miles south-southeast of River Clyde (cross). Heavy line shows drift of the floe, when manned by the Russians, until January of 1959.

find difficult to believe.

According to Trevor A. Harwood, one of the two visitors, three weather buildings were intact, including the one used for generating the hydrogen needed to inflate weather balloons. Another building had settled so radically that the

Diesel generator within it had punched through the roof.

This, he explained recently in an interview, was because the sun had melted much ice from around the building, whereas the generator itself protected the ice beneath it. He believes about fourteen feet had melted

off the surface of the floe since the Russians left.

Much food remained. There were jars of Crimean plums, coffee, tea, cocoa and various dried foods. A letter posted on a wall and signed by the last station leader, Dr. Nikolai A. Belov, invited visitors to eat, but asked that they notify the Arctic and Antarctic Scientific Research Institute in Leningrad of the station's location.

This has been done and the Soviet institute has asked for further details. Mr. Harwood is chairman of the Working Group on Ice in Navigable Waters of the Canadian Committee of Oceanography. He and his companion on the visit, Dr. Harold Serson, are also both with the Defense Research Board of Canada.

The floe presumably made its journey across Baffin Bay in the summer of 1960, for when found it was locked firmly into the ice that formed off the River Clyde inlet last winter.

North Pole 7 was so named because it was the seventh drifting station established by the Soviet Union on Arctic ice. It was occupied in May, 1957, to make observations during the International Geophysical Year of 1957-58.

Its prefabricated huts were made of foam-insulated wooden panels. Hemispheric tents were used as additional shelters. There was a heavy winch for lowering equipment 13,000 feet or more into the ocean.

The initial wintering party, under V. A. Vedernikov, consisted of sixteen men. An unusually candid account of psychological problems encountered at the station was subsequently published in the Soviet journal "Fizkultura i Sport."

After drifting close to the pole, the floe meandered towards the northeast tip of Greenland. It was small to begin with and after many months of colliding with other floes it became too short for aircraft landings. Hence its final resupply was by plane that landed on another floe thirty-seven miles away. Food and fuel were lifted the remaining distance by helicopter.

During the winter of 1958-59 the floe cracked through the camp, but it was not evacuated until the following March, when it was within 180 miles of Greenland.

Dr. Belov, who led the last party there, is an authority on ocean-floor sediment. His research equipment was still on the floe when the Canadians visited it last spring.

Arctic Weather Station

Jan Mayen Island, a Norwegian weather station, is a 147-square-mile area in the Arctic Ocean east of Greenland.

Soviet Nuclear Test Site Frozen Arctic Wasteland

By United Press International

Novaya Zemlya, where the Soviets have been conducting their nuclear test series, is a frozen wasteland of glaciers and polar bears.

It consists of two large and some smaller islands stretching 620 miles long by 24 to 68 miles wide in the Arctic Ocean between the Barents and Kara Seas.

Twenty-five per cent of the

area is covered with ice.

The region's summer is short and cool—rarely longer than two months. The air is moist with clouds and frequent fogs swirling over the glaciers and the mountain range of the northernmost island where the peaks reach 3,500 feet.

What was done with the island population—mostly Eskimo-type nomads who live by hunting and fishing—during the tests is not known.

Novaya Zemlya was dis-

covered by the Russians in the fifteenth century. Foreign explorers who arrived in the sixteenth century found remnants of Russian hunting camps.

The first permanent resident was Fyodor Vyika, of Nenets nationality, who arrived with his family in 1869. Other Nenets followed in 1877 and founded the largest town, Maliye Karmakuly.

Regular boat trips then were begun to supply the islanders. A cinema, library, school, food warehouses and dog kennels were built in succeeding decades.

The Russians also operate a meteorological station on the islands which are accessible by boat or plane.

Army Ice Tunnel Inaugurated By Sheltering 25 in a Blizzard

**U. S.-Canadian Study Group
Makes a Hazardous Trek
Back to Army's Cave**

By **WALTER SULLIVAN**
The New York Times.

CAMP TUTO, in Northwest Greenland, Oct. 6—Amid unexpected drama, the Army inaugurated last night its tunnel town 100 feet below the surface of the Greenland ice.

Twenty-five specialists and officials concerned with polar research, some of them veterans of several expeditions and record-breaking sledge journeys, visited the newly completed site. They then departed by bus. However, after covering only 200 yards along a knife-edged road, they were halted by a savage blizzard.

The road runs one and one-half miles from the tunnel mouth, near the edge of the ice sheet, to Camp Tuto. Camp Tuto is eighteen miles east of Thule.

The group staggered and crawled on hands and knees back to the tunnel. Several times a man was knocked down and almost blown into a chasm along the side of the road.

One man, snow packed between his eyes and his glasses, walked into the gap between the parallel spans of a "Treadway" bridge. This Army structure for crossing small ravines is open in the center. A companion hoisted the man out before he stepped into the abyss.

Another of the group, who has sledged more than 1,000 miles behind dog teams on a single journey, termed this the most harrowing experience of his life. All reached the tunnel in safety, although panting from exertion and from the suffocating effect of the wind, estimated at sixty to seventy miles an hour.

They, and the Army men who had prepared an inaugural dinner served by the under-ice gallery, became the first party to sleep here in the heart of the glacier.

Unlike Camp Century, the atomic-powered community nearer the center of the ice sheet, this one has been carved deep into the glacier by coal-mining machinery. Experimental buildings of various types are set in galleries radiating from the center tunnel.

Ample reserves of Diesel fuel are contained in a cavity carved out of the ice.

At Camp Century, deep trenches were cut out by Swiss snow-removal machines, then roofed over. It accommodates some 200 men.

This camp, which will be able

to handle about thirty men, is almost ready for occupancy. Both are designed, in part, to test the feasibility of burying military installations in the Greenland ice.

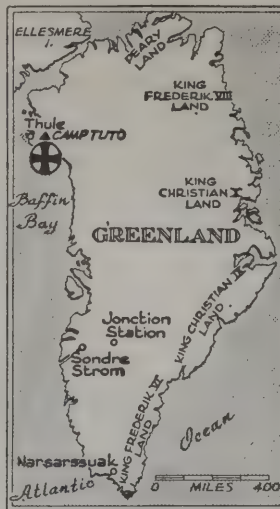
Among those who inspected the tunnel camp yesterday were several men whose polar experience extends back more than a generation. For them the rigors of the battle with wind and snow were especially wearing.

They are taking part in an American-Canadian review of Arctic research sponsored by the Arctic Institute of North America and the Office of Naval Research of the United States Navy.

Among those in the group are John Reed, director of the Arctic Institute and member of Scientific Advisory Board, United States Air Force; Dr. W. E. Van Steenburgh, director general of scientific services in Canada, Department of Mines and Technical Surveys.

Also, Glen Dyer, chief of polar operations in the United States Weather Bureau; Dr. Carl R. Eklund, chief of the Polar and Arctic Branch in the United States Army Research Office, and Capt. W. H. Keen, assistant chief for research in the Office of Naval Research.

Also, Dr. J. C. Arnell, scientific adviser to the Chief of Air Staff, Royal Canadian Air Force, and Capt. B. H. Andrews, commanding officer of the United States Naval Underwater Sound Laboratory in New



The New York Times Oct. 7, 1961
Site of the cave (cross)

London, Conn.

They were shown the 1,100-foot main tunnel, its walls sawtoothed by curved tooth marks of the mining machinery. It is illuminated by electric bulbs, each of which has melted its own recess one foot into the walls of the ice. The light diffuses from the glacier on all sides, emitting a blue-green glow that seems to come from within the ice itself.

In the two years since work on the tunnel began, its width has been shrinking at the rate of one and one-half feet a year. This is caused by the great pressure of the moving glacier.

Steel beams have been bent like a bow. The Army men have

to chip at the walls periodically to compensate for this shrinkage.

The bus in which the visitors made their abortive departure was not designed for polar use. As the driver inched forward, so as not to outrun his visibility of only a few yards, snow shot through the cracks around the bus windows like steam jets.

The vehicle, quivering in the wind that swept down off the great Greenland Ice Sheet, moved across two small bridges. Beyond the second it struck an obstacle, apparently a drift of snow. No amount of backing or charging could get it across.

Capt. Richard Sochacki, commander of Camp Tuto, a facility of the Arctic Polar Research and Development Center, which has charge of the tunnel, led the party back.

This morning the wind was estimated at 80 or 90 miles an hour. All was quiet within the tunnel, however, except for the hum of the ventilating equipment. When the blizzard ends the visitors will continue their tour of Arctic research stations.

Soviet Claims Arctic Record

MOSCOW, Nov. 4 (UPI)—The Soviet icebreaker Moskva has set a new Atlantic-to-Pacific speed record via the Arctic, Vody Transport, newspaper of the Soviet Merchant Marine Ministry, said today. It said the ship made the 1,800-mile trip from Murmansk to the Chukotka Peninsula in ten days, Oct. 18 to 28.

LONDON, Nov. 11 (Reuters)—The Soviet Union's 9,427-ton diesel-electric icebreaker "Moskva" has arrived in Vladivostok after a winter journey

Greenland Ice Cave Given a Test By Scientists in Unplanned Stay

By **WALTER SULLIVAN**

CAMP TUTO, Greenland, Oct. 7—An experimental camp tunneled 1,100 feet into the Greenland Ice Cap completed its initial, and unplanned, test today.

It proved to be a remarkably comfortable refuge for forty polar specialists and Army men marooned by a blizzard. The camp utilities, tested for the first time under a full population load, worked well.

Some 4,500 gallons of water were drawn from a well, melted into the glacier by heat from the exhaust of a Diesel-electric generator. Despite this, it filled up faster than the water was needed.

The sewage system, discharging into an ice cavern carved by coal mining machinery proved efficient and odorless in air that remained fixed at the temperature of the ice — 17 degrees above zero. winds outside that probably reached 90 miles an hour blew

Diesel exhaust fumes back into the tunnel at the height of the storm, but otherwise the ventilation system worked well.

In the well-appointed huts innerspring mattresses were spread on carpeted floors and the impromptu residents slept comfortably in their heavy clothing, hardly aware that 100 feet of solid ice hung over their heads and 200 feet lay underneath them. The entire camp is moving toward the coast at five feet a year with the gentle flow of the glacier.

The test of the camp's ability came about when a bus carrying a party of visiting polar specialists bogged down on the wind-swept road linking the tunnel with the Army's Camp Tuto and the Air Force Base at Thule, eighteen miles to the west.

The tunnel is due for occupation about Nov. 1. However, by good fortune, ample supplies

of food and fuel were in galleries radiating from the main tunnel.

As with the sewage, the oil is stored loose in a reservoir carved out of the blue-green ice. The camp is experimental. Like Camp Century, built earlier by roofing deep trenches on the ice cap, it is designed, in part, to study the feasibility of burying military installations in the ice.

The wind died down sufficiently this morning to permit the tunnel occupants to walk past their stalled bus and be ferried down off the glacier by tracked vehicles. The windward side of the bus' interior was packed to the ceiling with snow driven through the cracks by the gale. However, the bus did not blow off the bridge on which it was stalled, as had been feared.

As the party emerged from the tunnel, the fading phase of the blizzard was still swirling about the entrance. The group was therefore amazed to see an Arctic fox, trotting back and forth in the driving snow. His long winter coat made him appear as large as a bobcat, yet the landscape seemed to offer no scrap of sustenance.

WOMAN PHYSICIAN BOON TO ESKIMOS

Dane in Greenland in World's
Northernmost Practice

By WALTER SULLIVAN

The New York Times.

THULE, Greenland, Oct. 7—The northernmost medical practice in the world is that of a Danish woman who can trim a blubber lamp as well as she can wield a scalpel.

She is Dr. Ingrid Givskud, aged 37. The 550 Eskimos for whom she is responsible live along the 400-mile coast from Melville Bay to the northern tip of Greenland.

Her usual means of travel is the dog-sled. Her hospital at Kanak, a few miles north of here, has fifteen dogs, continuously in yelping readiness as ambulance-pullers. She has a Danish-trained nurse and four Eskimo student nurses.

She points out, however, that the natives of Greenland prefer to be called Greenlanders, rather than Eskimos.

Sometimes she has to perform emergency surgery by the light of a blubber lamp in a remote and primitive hut. Such lamps, she explains, are pans the size of a round coffee table with moss around the edges to serve as a wick. They are, however, fairly rare. Many Eskimos have kerosene lamps.

Dr. Givskud's mode of travel is not practical when she crosses the United States Air Force Base at Thule, where the residents of Kanak lived before they were displaced. The base is alive with jet planes and trucks.

When she and her dogs reach the edge of the base they are driven across it in a truck, according to a standing arrangement.

On occasion, in emergencies, the Air Force provides her with a helicopter.

Although she visited the base as a distinguished guest this week, she is not known to all here.

She recently pulled her team up beside one outlying American installation. She and her Eskimo companions set up their tents for the night and built their usual windbreak of snow blocks.

Dr. Givskud had stopped to tell the Americans that she planned to camp near by. Suddenly a young American officer appeared with two parcels.

"These are steaks," he said to the Danish woman. "I didn't know how you eat them, so those in this bag are raw. In this bag, they are rare."

Dr. Givskud obtained her medical degree at the University of Copenhagen in 1954 and applied for a job in Africa. Be-



The New York Times (by Walter Sullivan)

Dr. Ingrid Givskud



The New York Times

Oct. 10, 1961

Shaded area shows extent of Dr. Givskud's practice.

cause of turmoil there she found women less welcome than men. So she came to Greenland in 1956.

Among the operations she has done in the field are appendectomies and gall bladder removals.

So highly regarded is she by the Eskimos that she has been elected a member of the local hunters' council—most unusual for a woman and a non-Eskimos. This body is the local parliament.

Sometimes she and her companions build a snow house when a blizzard springs up, but usually they have their tents along. Periodically, she tours for several weeks up and down the coast, tending to the scattered residents of this inhospitable land.

Polar Bear Adaptable

Although the polar bear's native habitat is the ice-covered Arctic region the animal takes to captivity quite well and can be kept in zoos while some animals from more temperate climates cannot.

WATER HOLDS OIL FOR ARCTIC TROOPS

Sand, Gravel and Ice Form
Container in Greenland

By WALTER SULLIVAN

The New York Times.

CAMP TUTO, Greenland, Oct. 7—In a tunnel near here there is a 500-gallon Diesel-oil tank made entirely of sand, gravel and water.

What holds it together is the fact that the water is frozen. This new polar building material, known as permacrete, is a controlled version of permafrost, which is the permanently frozen ground that underlies much of the polar regions.

The study of its structural properties is but one approach being made by the Army Engineers to the problem of obtaining building materials in remote parts of the Arctic. They have learned how to make beams out of snow and construct a good-sized hut from material shipped north in two barrels.

Others are also attacking the polar construction problem.

The Air Force at Thule, eighteen miles west of here, has been experimenting with strengthening ice floe runways by reinforcing the ice with plastics.

The Navy, at Point Barrow, Alaska, has been spreading chicken wire and various fabrics on the ice, then spraying them with water to build up reinforced ice runways.

The Canadians have been studying the properties of permafrost, or frozen ground, with another problem in mind. How can a soldier dig a foxhole in such terrain?

The Army's studies of permacrete are being carried out in a 600-foot tunnel, blasted out of permafrost near here. It is one of several buried installations in this area.

The others include a deeper tunnel in the shoulder of the ice cap and Camp Century, the atomic-powered camp scooped out of the ice 138 miles inland across the ice sheet.

The interior of the permafrost tunnel has been partly furnished with tables and chairs made of permacrete. Structures of this substance must be protected from artificial heat and from the summer sun, even in so chilly a place as northern Greenland.

The study of permacrete includes experiments to determine the ideal mixture of sand, gravel and water and the structural properties that result. Thus, in the tunnel, 6-by-6-inch beams 3 feet long are tested for their breaking point. Pillars are compressed to determine their strength.

According to the Army men, properly made permacrete is

three or four times stronger than unreinforced concrete, apparently because it is less rigid. Its cushioning properties suit it well to protection against bombs. A 50-by-50-foot chamber has been excavated at the end of the tunnel and has proved so stable that it is thought that much larger caverns can be used.

The permacrete tank has been filled with 500 gallons of Diesel oil. Next summer, after a year's storage, the fuel will be tested for impurities. Some believe such tanks, their walls glazed with pure ice by water spraying, will prove the most economical solution to the storage of large quantities of fuel in the far North.

The engineers here are also enthusiastic about their new "buildings-in-barrels." The substance used is polyurethane which expands thirtyfold when mixed into a foam. This is placed in forms and hardens into panels that, although they weigh only thirty-five pounds, are excellent insulators.

The panels are faced with a smooth skin, inside and out, like the fiberglass used in making boats. One drawback is the need to haul heavy forms to the construction site. However, in the ice tunnel, it is planned to try out a dome-shaped balloon as a form.

Such balloons have been used at Camp Century as forms on which to spray milled snow. The snow is chewed out of the ice sheet surface by a machine made in Switzerland for clearing deep drifts in the Alps. It produces a stream of powdery snow that can be aimed off the road—or onto something that needs to be buried.

This milled snow binds rapidly and hardens further after several days' aging. The balloon is then deflated, leaving a sizable chamber. A similar technique has been used to span the nine-foot-wide tunnels at Camp Century, except that metal arches were used as forms instead of balloons.

Experiments are being conducted to determine the structural properties of arched beams made of this hardened snow. One of the heavier Air Force planes, a C-124 Globemaster with wheeled landing gear, has set down successfully on an airstrip built atop the ice sheet with milled snow.

Another project here seeks to determine if radar reflectors are feasible as trail markers along blizzard-swept trails across the ice sheet. Likewise methods are being explored for detection, from the air, of objects buried beneath the surface. Such a technique would be useful both in finding one's own snow-hidden equipment and hostile installations.

Finally the Army wants to find a way to prevent the walls, ceilings and floors of its ice tunnels from melting from the heat of buried buildings or the friction of vehicle traffic.

ANTARCTIC TEAM SETS BUSY SEASON

200 U. S. Scientists From
25 Organizations to Join
Wide-Ranging Program

By JOHN A. OSMUNDSEN

The New York Times.

The most ambitious scientific research program that the United States has ever pursued in the Antarctic is scheduled to begin soon, the National Science Foundation said Aug. 13.

Early in October, nearly 200 scientists from more than twenty-five universities, research institutions and Government agencies will begin research projects on and around the most remote and least known continent in the world, the foundation said. Cost of the projects is estimated at \$5,500,000.

It will be the first southern summer for research in the Antarctic since the twelfth-century Antarctic Treaty went into effect. The treaty reserves the continent for use as the world's largest scientific laboratory.

Areas of research there this year will include biology, geology, glaciology, gravity, mapping, meteorology, oceanography, upper atmosphere physics and seismology.

The foundation funds and coordinates the United States Antarctic Research Program, which is administered by the foundation's Office of Antarctic Programs. Logistic support for the scientific work is provided by the Navy's Task Force 43, commanded by Rear Admiral David M. Tyree.

In addition, scientists will for the first time have a floating laboratory, the Eltanin, for research in Antarctic waters. The vessel will operate under a lease agreement between the foundation and the Military Sea Transportation Service. It will accommodate oceanographers, meteorologists, physicists, marine biologists and submarine geologists.

The biological research includes a search for bacteria in Antarctic lakes and ponds that are ice-free and warm enough to support life for short periods in summer. A search for microbes in the waste materials of penguins and skua gulls will also be made to determine whether these birds are potential disease carriers.

One of the scheduled geological studies springs from a discovery made that was made by two University of Kansas biologists. They found two small fresh-water lakes in the Mount Gran Dry Valley with bottom

POLAR WORK ADVANCED

Navy to Begin Its Antarctic
Operations Earlier

WASHINGTON, Aug. 31 (UPI)—The Navy today advanced the schedule for its annual Antarctic operations and announced plans to complete a nuclear power plant in the South Polar region next year.

Rear Admiral David M. Tyree, commander of Operation Deepfreeze, left with his staff for their advance base at Christchurch, New Zealand. They hoped to reach the Antarctic Sept. 30, a month earlier than last year. Winter here coincides with summer there.

Admiral Tyree said 3,000 men, ten ships and more than thirty planes would be used in supporting this year's Antarctic research program, which is directed by the National Science Foundation.

One of two major projects will be the completion of a 1,500-kilowatt nuclear generating plant at the naval air facility on McMurdo Sound.

temperatures as high as 70 degrees Fahrenheit and with high salinity. Kansas geologists will return this year to try to find the reason for this phenomenon.

Cartographers from the United States Geological Survey plan to map a 90,000-square-mile area of the Antarctic coast of the Ross Sea and the Ross Ice Shelf. University of Michigan glaciologists will continue their measurements of ice movement on the shelf, which is the largest mass of floating ice in the world.

Radiation studies in the program include one in which the Douglas Aircraft Company and the foundation will sponsor a research station at McMurdo Sound for the study of solar flares. Solar flares are massive gas explosions on the sun that create a serious hazard to space exploration.

WELLINGTON, New Zealand, Sept. 30 (Reuters)—America's most ambitious Antarctic program to date involves three construction jobs and a record scientific schedule.

Rear Admiral David Tyree, commander of "Operation Deep Freeze," says he expects the projects to make the coming summer the busiest and most successful ever undertaken by Americans in the Antarctic.

The first project is the installation of an atomic reactor that should begin to supply the base at McMurdo Sound with electric power next March.

Preliminary work on the reactor site began last summer. Excavations were made and buildings were started.

The reactor itself will leave the United States in November for delivery at McMurdo Sound Dec. 15.

U.S. TO FLY A CAMP TO THE ANTARCTIC

Magnetic Ducting of Radio
Signals to Be Studied

HONOLULU, Sept. 2—Plans are being drafted for a camp whose huts can be airlifted bodily to a site deep in Antarctica.

When the camp's fifteen scientists open the doors for the first time it is expected that they will find their electronic gear fully installed, spare parts already unpacked and sorted into bins, and stoves ready for cooking.

The camp is to be used to observe magnetic ducting of radio signals between the northern and southern hemispheres of the earth. Such ducting is viewed by some as a potential communications channel immune to jamming by a hostile power.

The site is to be near Thurston Peninsula in Marie Byrd Land. It would take most of an Antarctic summer and a large crew of builders to set up a camp there, using tractor-hauled or airlifted materials in the manner that has been the practice in that region to date.

About fifteen huts of the trailer type will be needed for the camp, some of them designed to be fitted together. The National Science Foundation has asked the Lockheed Aircraft Corporation to design huts that will fit snugly into that company's C-130 Hercules air transports.

These turboprop aircraft should be able to carry two sixteen-foot huts, or a single thirty-eight-foot hut. They are to be mounted on rails inside the plane.

When the cargo door under

the tail of the plane drops down to serve as a ramp, the trailer will be rolled out until part of it protrudes. Skis, fitted to legs that ride in slots on either side of the hut, will then be lowered to the snow and the plane will taxi slowly forward.

This will move the hut farther out until a second pair of ski legs can be lowered. The plane will then depart and the hut can be jacked down until it is flush with the snow. A small tractor, also flown in, is to be used to haul the huts into position and fit them together, where appropriate.

In this manner it is expected that the entire camp can be lifted in and put in operation within a few days.

The vicinity of Thurston Peninsula has been chosen because the force lines of the world's magnetic field that emerge from the earth in the Northeastern United States return to earth in that part of Antarctica. In between they arch out thousands of miles into space like a gigantic rainbow.

It has been found that low frequency radio emissions from lightning flashes, known as whistlers, travel along such force lines. More recently it has been discovered that far higher frequency signals, such as those used for radar, likewise travel such paths.

Apparently the earth's magnetism tends to align electrons in space into filaments oriented along the force lines. These act somewhat like the coaxial tubes used to channel television signals.

Because the earth's magnetic field is distorted when magnetized gas clouds from the sun fly past, the proposed observations may be useful in determining more accurately the nature of these distortions. The scientific planning is being done, in part, by Dr. Robert A. Helliwell of Stanford University in California.

When it has been installed, the Martin Company, contractors for its supply and construction, will operate it for a six-month test period before handing it over to Navy personnel.

With the reactor in operation, the major supply problem of the Antarctic—getting oil fuel and generators from the outside world—will be eased.

Plans provide for the eventual installation of reactors at the Antarctic-Byrd station, the South Pole base and a second reactor at McMurdo.

Admiral Tyree said these reactors would make it possible to introduce new scientific experiments in the Antarctic, experiments that require the generation of more power than is at present available.

Radioactive waste disposal will be carried out under the terms of the Antarctic Treaty. It will be sealed in containers

to prevent any loss of radiation, carried to the United States and disposed of there.

The second major task this year will be the completion of new housing at Byrd station. The old base is now so far under snow that there is danger of loss of life through crushing of the huts.

The third major construction job is to complete the installation of a new communications and navigation system. During a sunspot magnetic storm last year, all communications in the Antarctic were blacked out for six days.

More powerful modern electronic equipment will be installed this summer to supplement the facilities already operating at the McMurdo and South Pole bases. It will be installed at Byrd base and the joint United States-New Zealand base at Cape Hallett.

PENGUINS RECALL VOICES OF MATES

Sounds Reunite Polar Birds
After Long Separation

By HAROLD M. SCHMECK Jr.

The New York Times.

SKYLAND, Va., Sept. 15—The Adelie penguin can recognize its mate's voice when it returns after months of absence to a densely crowded nesting area, an Antarctic scientist said yesterday.

The ability to remember and recognize another penguin's voice extends to chicks, who respond immediately even to tape recordings of their parents' voices, the scientist reported.

Richard L. Penney of the University of Wisconsin told scientists meeting at Skyland Lodge here that a penguin's skill at auditory recognition appeared to be an important factor in its ability to rejoin its last year's mate at the beginning of each new mating season. The scientist said there was no reason to believe a pair remained together between seasons.

The Adelie, much photographed by visitors to Antarctica, are smaller than emperor penguins. They stand about fourteen inches high when adult and weigh between five and eighteen pounds, depending on how long they have gone without food.

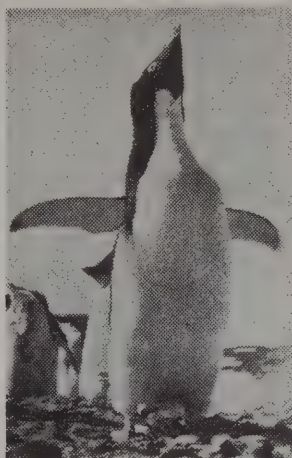
An Adelie may live to be fifteen years old, Mr. Penney said. They start breeding at about the age of 3 and seem usually to keep one mate and one nest site all their lives.

The scientist also made long-distance homing experiments, believed to have been the first done with penguins. These showed that the Adelie could return to its nesting spot—a speck of territory less than three feet in diameter—from 2,400 miles away.

Mr. Penney spent two seasons at Wilkes Station in the Antarctic banding Adelie penguins, photographing them and studying their habits during summer breeding periods. He said that 3,000 adults lived in thirteen nesting colonies near Wilkes.

Mr. Penney described the research and showed films taken during his study at a briefing being held here for scientists who will leave soon for the 1961-62 summer session on the Antarctic continent. The National Science Foundation is conducting the briefing.

As a preliminary to long-range homing studies he took penguins about fifteen miles from the nesting area. He discovered they had no trouble



The New York Times (by Walter Sullivan)

HEARS VOICE OF LOVE:
The Adelie penguin, which can recognize the voice of its mate when it returns after months of absence.

finding their way back.

In December, 1959, he sent five male Adelie penguins by air to McMurdo Sound, where another scientist released them.

Three of the five returned to their nesting sites by mid-October of last year. Since penguins cannot fly, they journeyed by walking, swimming and sliding across the ice. Mr. Penney estimated they must have traveled 2,400 miles along the coast.

He said he had no idea how the birds had found their way home under the punishing weather conditions of the south polar regions. He has observed evidence that the penguins are adept at picking out landmarks and recognizing clues to the presence of open water near by.

The birds' ability to distinguish voices within their own species would seem remarkable in view of the fact that the birds are fairly primitive and that their recognition calls apparently have few overtones. On tape, the calls are low-pitched and grating squawks.

The ability of these penguins to recognize each other by voice after a long absence suggests, Mr. Penney said, that the skill could reach a high degree of precision among songbirds.

Others Have Same Gift

French studies have shown that emperor penguins also find their mates, after prolonged separation, by voice recognition. This occurs when the females return to the rookery, where the males have remained to hatch the eggs.

Mario Marret, leader of the French party that studied a rookery throughout one winter, described how the females returned by the thousand after

PRIMAL ANTARCTIC HELD ENDANGERED

Scientist Urges Expeditions
to Keep Area Unspoiled

The New York Times.

SKYLAND, Va., Sept. 16—Antarctica, virtually unspoiled and uncontaminated by man, may be in danger of losing its primordial naturalness, a scientist warned here yesterday.

"The present is the moment of crucial responsibility," said Dr. Robert Cushman Murphy of the American Museum of Natural History in New York.

He addressed a group of about 100 scientists being briefed here this week by the National Science Foundation for the 1961-62 season of research in Antarctica. Many of the specialists will leave for the South Polar region in a week or so for the nation's most ambitious scientific season there.

"I need hardly remind you," said Dr. Murphy, an internationally known authority on birdlife, "that in almost every other land area he (man) has transformed primordial conditions to such an extent that we have only a highly imperfect idea of what they once were."

Even Antarctica has thus far escaped "profound alteration by only a narrow geographical margin," he said.

The scientist noted that men were going to the Antarctic in ever-increasing numbers. He urged that such expeditions exercise care to avoid upsetting the natural balances of life in that region.

"We have to remember," Dr. Murphy said, "that parties from a dozen or more nations, working year after year in the Antarctic, possess very much greater potentialities for harm than the single occasional expeditions that entered the field between 1840 and the beginning of the present century."

The resources of the Antarctic should be used only purposefully for justified cultural aims, he declared.

Even man's friendly and amused interest in the penguin was cited as hazardous unless tempered with restraint.

"A penguin colony cannot be a human playground if it is to

the two-month hatching period. They circulated through the crowds of males, singing hopefully.

At such times, he wrote, "the rookery is agog and there is an almost deafening noise of song and countersong."

remain a penguin colony," he declared. "Those who have spent weeks recording the normal behavior of colonial animals during their season of reproduction know this all too well. The same devoted researchers know likewise the murderous havoc that can result from heedless maneuvering of planes and helicopters."

He also deplored as "childish" the enmity that Skua gulls arouse in some visitors to the Antarctic because the Skuas prey on penguin eggs and chicks. This relationship between Skua and penguin has presumably endured for millions of years, he said.

"To make a moral issue of clubbing skuas and smashing their eggs is of no benefit to the penguins or anything else," he declared. "We are all down there to learn the ways of nature, not to reform them."

The forbidding climate of Antarctica has proved capable of compensating for most of man's carelessness as well as his deliberate blunders in the past, Dr. Murphy said. While islands near the South Pole land mass long ago were invaded by ship-borne rats to the serious detriment of native life forms, conditions farther south have been too rigorous for such contamination by alien species.

Dr. Murphy suggested, however, the "not altogether remote chance" that wild dogs might become established on Antarctica and imperil the largely defenseless penguin populations.

POLAR VOYAGE STARTS

Cutter Eastwind Is Vanguard
of Antarctic Expedition

BOSTON, Sept. 19 (AP)—The Coast Guard cutter Eastwind sailed today for the Antarctic. She is the vanguard of a group of Navy and Coast Guard icebreakers that will operate at the bottom of the world again this year.

The Eastwind, under the command of Capt. Joseph W. Naab Jr. of Freeport, Me., left a month earlier than usual for Operation Deep Freeze. The project includes smashing a clearwater path in the McMurdo Sound area. The foundation for a huge nuclear reactor has been constructed there and cargo ships will bring in reactor parts.

It is the fourth south polar voyage for the Eastwind, which has a crew of 220.

Antarctic Season Opens

WELLINGTON, N. Z., Sept. 27 (AP)—Two United States Navy Hercules planes landed at McMurdo Sound, Antarctica, today to open operations for 1961-62. It is the earliest that the Antarctic season has ever been opened. The temperature at McMurdo sound was 33 degrees below zero.

SCIENTISTS START ANTARCTIC WORK

1,400 Americans Converging
on Region for the Summer

By HAROLD M. SCHMECK Jr.

The New York Times.

Oct., 29

About sixty aircraft have been flown into the Antarctic from New Zealand in the last month to help set up the most ambitious research program in the history of the south polar region.

Only 198 men wintered over at the four United States Antarctic bases, but the population during the dawning summer season is expected to reach a peak of about 1,400. The central purpose of this influx is scientific research, a portion of which may have implications for the entire planet.

The Antarctic ice sheet totals 7,000,000 cubic miles—as great an accumulation of ice as that which covered North America during the last Ice Age. The very existence of the Antarctic ice sheet governs the relationship between sea and land in all coastal areas of the world. It is known that the Antarctic ice affects climate to the north, but the extent and magnitude of the effect is not known.

Scientists at several locations will be studying the ice sheet in the hope of unraveling its past, understanding its present and even perhaps predicting its future.

Similarly, geologists expect to penetrate portions of the continent never before visited by man for clues to the history of the land mass. Greater understanding of the history of the earth's crust and of the drifting of continents are among the ultimate goals of this work.

Biologists are studying the sparse land life and abundant marine life of the region to discern the compromises and special arrangements living things have made to come to terms with the harshest environment on earth.

The cost of all the grants made for this year is put at \$5,500,000 by the National Science Foundation, which supports and coordinates the program. Logistic support is provided by the Navy's Task Force 43 commanded by Rear Admiral David M. Tyree who, last month, returned to the Antarctic at the opening of the new season.

The year's program includes major overland expeditions. Seven specialists, led by a geophysicist of the University of Wisconsin, will make a 1,200 mile zigzag traverse in the area inland from the Bellingshausen Sea. A four-man team from the University of Minnesota will spend twelve weeks in man's



U. S. Navy

SUPPORTS RESEARCH:
Rear Admiral David M. Tyree, who commands Navy group providing logistic support to Antarctic bases.

first geological reconnaissance of the Sentinel Range, considered the largest unexplored mountain range in the world.

Scientists from Rutgers will undertake the first concentrated studies of soil and its formation that have been made by the United States in the Antarctic.

A main objective will be to study primitive soil-building processes as they take place in the Antarctic environment.

Biological research has been stressed far more since the end of the International Geophysical Year than ever in the previous history of Antarctic exploration. The National Science Foundation has listed thirteen separate grants in biology for this year totaling more than \$260,000.

Among these will be a project to determine if bacteria and other micro-organisms can exist in permanently frozen soil. If such microbes are present deep in the permafrost they presumably represent species thousands of years old.

Another project will study Antarctic lichens more thoroughly than has ever before been attempted. A lichen is not a single primitive plant but a remarkably complex partnership between a fungus and an alga.

Study of the distribution of Antarctic lichens, their evolution, their relationship to other lichens and to the glacial history of the areas in which they grow is expected to help explain the relationship of Antarctica to the other continents.

Among several grants for studies of birds in the Antarctic is one to continue large-scale work in bird-banding. So far some 10,000 oceanic birds have

A Never-Frozen Pond Is Found in Antarctic

WASHINGTON, Oct. 26 (UPI)—Scientists have found a miniature dead sea in Antarctica so salty that it probably never freezes even though winter temperatures drop to 60 degrees below zero.

Discovery of the body of water, actually a shallow pond, was posted today in a dispatch from McMurdo Sound, Antarctica, by Richard Litel of the National Science Foundation.

The pond, about eighty miles from McMurdo Sound and forty miles from the sea, is about eleven times more salty than ocean water. It is about 700 yards long and 200 wide. Its average depth is four inches, although there are pools a foot deep. Old beach lines indicate it may once have been thirty feet deep.

A Navy helicopter flying a science mission over the Wright Valley in southwest Victoria Land found the pond last month.

So far scientists have not been able to determine what caused the high salt concentration in the pond.

been banded in this program for better understanding of their physiology, their behavior and their range of flight.

Altogether, the areas of research being pursued this year include biology, geology, glaciology, gravity, mapping, meteorology, oceanography, physics of the upper atmosphere and seismology.

By the end of the summer season, a few months from now, most of the 1,400 men will have left Antarctica. Remaining will be 270 scientists and other personnel who will spend the Southern winter of 1962 in the Antarctic darkness.

U. S. Operation Speeded

By HAROLD M. SCHMECK Jr.

The New York Times.

CHRISTCHURCH, N. Z., Nov. 3—Supply operations for this year's United States Antarctic research program are moving faster than in any previous year, according to Navy spokesmen here.

They estimate the supply program has reached a stage easily three weeks ahead of that attained last year by the same date. An early start, superior planning born of much experience and uncommonly good weather are given credit for this year's fast pace.

Speed is important because the supply season is brief and the whole research program depends on the flow of supplies.

This year's first flight to the Antarctic was made on Sept. 27. Since then big cargo planes have made about 110 flights be-

tween Christchurch and the main United States base at McMurdo Sound. About 200 flights have been made within the Antarctic Continent itself, including fifteen airdrops of supplies to the inland Byrd and Pole stations.

This Operation Deep Freeze 62 is mounting the largest scientific assault in history on the South Polar region. Moreover, two major construction projects are under way. These are the building of a new Byrd station on the Antarctic plateau and the construction of a nuclear power station at McMurdo.

The great bulk of equipment and supplies needed for the year's program will be brought in by ship. Three icebreakers are scheduled to reach McMurdo by Nov. 20, permitting the first supply ship to get in. Some 700 tons of vital cargo and personnel, however, must be flown in earlier by Air Force and Navy planes.

Of this total, 510 tons have already been delivered. Last year that much tonnage had not arrived until after mid-November. So far this season some 600 tons of high-priority cargo have been moved by air from McMurdo to other sites of Antarctic research.

A Navy briefing officer said it was mid-January last year before a comparable amount of material had been moved inland. Last year the program suffered severely from poor weather and from serious magnetic storms that blacked out communications and thus prevented flights even when weather was clear.

Part of last year's supply difficulties have been attributed to the Chilean earthquakes. Indirectly they caused excessive break-up of the Antarctic pack ice. This in turn had a bad effect on weather because of the excess moisture loosed into the atmosphere from the open water.

ATOM CONTRACT IS LET

Upstate Plant to Build Power
Station for the Antarctic

WASHINGTON, Nov. 3 (AP)—Alco Products Inc., of Schenectady, N. Y., has been awarded a contract to design and build a nuclear power plant. The plant will supply power and heat for an Antarctic station used by the National Science Foundation for scientific studies.

The Atomic Energy Commission announced the signing of the contract today. It did not designate the amount of money involved.

The plant is to be designed so that its parts can be transported to the Antarctic by planes and assembled there. Shipment from the United States is to be in September, 1963.

5 DIE IN AIR CRASH IN THE ANTARCTIC

Minnesota Scientist Among
Victims on Navy Plane

WASHINGTON, Nov. 9 (UPI)—The Navy reported tonight that a University of Minnesota Scientist and four Navy crewmen were killed in the crash of a twin-engined Neptune plane early today in the Antarctic.

The scientist was Dr. Edward C. Thiel. He was a member of the United States Antarctic research program of the National Science Foundation.

The Navy said four other crewmen of the plane were injured in the crash at Wilkes Station.

The craft crashed on take-off as it headed back to McMurdo Sound on the return leg of a scientific survey flight. The plane had previously stopped at the Russian Antarctic base of Mirny on a flight to gather data for a magnetic field map of the Antarctic.

The dead crewmen were listed as:

Lieut. Comdr. William D. Counts, of East Greenwich, R. I.

Mechanic 1/C William W. Chastain, of Mount View, North Kingston, R. I.

Lieut. Ronald P. Compton, son of John R. Compton, of Denver.

Machinist Mate 2/C James L. Gray, son of Mrs. Margaret Mary Gray of Creeskill, N. J.

The injured were listed as: Lieut. Elias J. Stetz of Hicksville, L. I., pilot; Technician 2/C Clarence C. Allen Jr., Portsmouth, Va.; Electricians Mate 1/C Jack C. Shaffer, Greenwich, R. I., and Lieut. Ernest L. Hand, Elm Mott, Tex.

The plane was based at the Quonset Point (R. I.) Naval Air Station.

One purpose of the flight was to take Dr. Madison Pryor, an American biologist, to Mirny, where he will spend the winter under the United States-Soviet exchange program for scientists.

Active in Exploring

Dr. Thiel had in recent years been one of this country's most active scientific explorers of Antarctica. This would have been the fifth summer that he had spent on that continent, where summer coincides with the northern winter.

He was well known for his use of aircraft to leapfrog between observation sites on the ice. During the summers of 1958-59 and 1959-60, he showed that there was no large trough beneath the ice between the Ross and Weddell Seas.

Dr. Thiel was born in 1928 at Wausau, Wis. He obtained both bachelor's and doctor's degrees



Dr. E. C. Thiel



The New York Times Nov. 10, 1961
FATAL CRASH: Where Navy plane fell (cross). Arrows show earlier hops.

from the University of Wisconsin, the doctoral in 1955. He worked at the University of Utah as a research fellow until 1956, when he became a geophysicist with the American Geographical Society.

In that role he used high-precision gravity measurements to record ice thickness on the Blue Glacier in the Olympic Range of Washington.

His first trip to Antarctica was with the party that established Ellsworth Station in 1956-57 for the International Geophysical Year of 1957-58.

He joined the faculty of the University of Wisconsin in 1957 and moved to the University of Minnesota in 1960. His most recent post had been as assistant professor of geophysics in the School of Mines and Metallurgy.

He is survived by his widow, the former Patricia Griffiths, whom he met while at the University of Wisconsin and married in 1960. Also surviving are his parents, Mr. and Mrs. Edward A. Thiel of Wausau, and a sister in Baltimore.

Helicopter to Map the Antarctic On Mountain-Hopping Journey

By HAROLD M. SCHMECK Jr.
The New York Times.

McMURDO SOUND, Antarctica, Nov. 5.—Three engineers and a helicopter will start a mountain-hopping expedition tomorrow from which will come an accurate map of 100,000 square miles of Antarctic mainland.

The work is part of the slow process of erasing the word unknown from large stretches of the most isolated and forbidding continent on earth. When completed the map will be far the most accurate ever made of the region it covers. It will be a valuable aid to aerial navigation and exploration on the ground.

The three-man mapping team will be moved by helicopter from frozen peak to peak in mountains that would take weeks to conquer by foot, if they proved to be scalable at all. In the present project the topographical engineers from the United States Geological Survey will cover from four to five peaks a day. Some of the mountains are more than 10,000 feet high.

The purpose is to tie down with pinpoint accuracy the distance from peak to peak, the relative positions of one with respect to the others and to note enough of the physical characteristics of each mountain so that it can be recognized in an aerial photograph covering the whole region.

Last year Navy fliers took aerial photographs of about 100,000 square miles of the mountains that march north and south past McMurdo Sound along the inland fringe of the Ross Ice Shelf on the west coast of Antarctica.

To translate these photographs into an accurate map, however, requires the establishment of control points whose positions are known with great accuracy. Such accuracy requires a ground survey. Traveling by helicopter and measuring peak to peak distances with electronic measuring devices, the three-man team will move step by step south from McMurdo, main United States Antarctic base, to Beardmore Glacier. Later in the summer, the team will go from McMurdo north to Cape Adare.

The measurements will be made between peaks as far apart as twenty miles. The pinpointing will be accurate to within one foot over distances of fourteen to twenty miles, according to William H. Chapman, one of the engineers on the project.

Army helicopters will set the mapping party down on the often inaccessible mountain peaks. Navy planes will provide the expeditions' supply needs.

The mapmaking will be done in Washington from data gathered here. The Antarctic topographical project is supported by the National Science Foundation.

ROCKETS TO ASSAY ANTARCTIC WEATHER

WELLINGTON, New Zealand (Reuters)—Three experts from the University of Texas will supervise meteorological rocket firings to heights of almost forty miles in Antarctica.

The firings, which will begin in March, will help determine temperature and wind profiles of the McMurdo Sound region. Until now, temperature and wind have never been systematically measured in the stratosphere at these latitudes.

Navy rockets will be fired as high as seven miles next year in the project at Ross Island base.

The three experts will spend from late November to February preparing a launching site and setting up tracking antennas. A rocket launcher is to be placed near a new cosmic ray building at Ross Island.

150-Ton Whales in Antarctic
The blue whale of the Antarctic may reach a length of 100 feet, weighing up to 150 tons.

MT. EREBUS SURVEYED

New Measurement Puts Height
at 12,280 Feet

WASHINGTON (Science Service)—Mount Erebus in the Antarctic is 12,280 feet high, according to a recently completed survey.

The height of this smoldering volcano has been enveloped in doubt during the last fifty years. Its height was first computed during an expedition from 1910 to 1913 to be 13,200 feet. A later survey jumped the figure to 15,325 feet, and to add to the confusion, cartographers have recently used the figure of 14,997 feet.

Discrepancies in the earlier figures were caused by poor surveying conditions. Only during the latest survey was it possible, by electronic means, to measure a base line long enough to provide the precise measurements, the United States Geological Survey reported here.

The best-known dwellers of the Antarctic are the penguins, of which at least eight species breed in the snowy barrens.

SNOW BEING MINED AT THE SOUTH POLE

Project's Aim Is to Improve Under-Snow Camp Design

By HAROLD M. SCHMECK Jr.
The New York Times.

SOUTH POLE STATION, Nov. 12—Two men are working in a mine here at the bottom of the world.

They are mining snow, but the finished product comes to much more than water. It is research that shows promise of improving the design of under-snow camps here and elsewhere.

A subsidiary project may give the first really accurate measurement of the amount of meteoric dust that falls on earth from space.

The mine shaft is carved ninety feet deep into the snow on which the United States Amundsen, Scott South Pole Station rests. Snow at the bottom of the shaft is estimated to have fallen between 200 and 250 years ago.

During the last ten months the first detailed, rigorous studies of subsurface snow characteristics have been made here. Though snow is plastic, tending to flow to fill any holes cut in it, the frigid compacted snow under the pole station has been found to have great strength and stability.

At the mine's lowest level, the sagging of the snow ceiling during the last ten months has been only about a third of an inch, according to Rene O. Ramsler.

He and Edward Oliver, both of the United States Army Corps of Engineers' Cold Region Research and Engineering Laboratory at Hanover, N. H., are doing the snow mine studies.

Mr. Ramsler said the deep snow here is much stronger than at a Greenland icecap site he studied, although the South Pole snow apparently hardens more slowly.

The mine-bottom temperature here is a constant 62 degrees below zero Fahrenheit, against 4 below at the Greenland site. South Pole subsurface snow deformation is so slow that light inexpensive foam plastic buildings might be installed here with a life expectancy of decades if set in big enough trenches at a reasonable depth, Mr. Ramsler said.

The United States has already built one under-snow station at Camp Century, Greenland, is building another in Antarctica where the existing Byrd Station is being crushed under accumulated snow. The Byrd project uses trenches arched over with corrugated iron, later re-covered with snow.

The complex snowstructure analysis here coupled with work

Relief Contingent Takes Fresh Eggs To South Pole

By FRANK CAREY
Associated Press Science Writer

SOUTH POLE STATION, Antarctica (AP)—The men at America's coldest and most remote scientific station at the bottom of the world went on a midnight binge—on fresh eggs.

The occasion was the arrival of the first relief contingent for the 20 scientists and U.S. Navy men who wintered at this lonely outpost buried under up to eight feet of drifted snow. With them came the first fresh eggs and milk the South Pole group had seen in almost nine months of isolation from the outside world.

The celebration got under way right after the nightly movie. Within an hour, 15 men had tucked away more than 100 eggs in the warmth of the galley while the temperature above the snow-covered roof stood at 45 degrees below zero.

"I ate eight eggs myself," C. D. McKenny of Phoenix, Ariz., a meteorology technician, said grinning. "I had two poached, two boiled and the rest fried."

The relief contingent of sailors and Seabees, and three crates of eggs and 10 gallons of milk, came on a Navy cargo plane from the McMurdo station some 800 miles away.

On another plane were a group of New Zealand government officials and nine newsmen.

The two planes were only the fourth and fifth aircraft to land here since the beginning of the "summer season." One, on Oct. 30, brought the first fresh oranges, apples, lettuce, potatoes and radishes the men had seen since Feb. 17, when the South Pole station buttoned down for the antarctic winter. But the men still yearned for fresh eggs and milk.

"We had frozen eggs and vegetables all along," said chief cook Chester Wagner of Rochester,

at other sites will allow engineers eventually to calculate construction characteristics of any snow after a few simple measurements, Mr. Ramsler expects.

Dust filtered from other subsurface snow samples here is being collected for Dr. Henry Bader of the University of Miami (Fla.).

Antarctica's isolation and virtually total freedom from air pollution are expected to facilitate the distinguishing of earth dust from meteoric dust with previously unmatched accuracy.

Minn., "but all you can do with frozen eggs are scramble them and make omelets and you get tired of those after awhile."

The station's scientific leader, bearded chief meteorologist Ben W. Harlin, said the lowest temperature of the winter was 102 below zero, on Aug. 12. The record is minus 110 degrees, recorded on Sept. 13, 1959.

The chief recreational project during the winter was the building of the "Bamboo Room," a cozy little place with walls surfaced with bamboo rods ordinarily used for markers on the snow.

Beer is available in this southernmost bar in the world.

Here, and in the galley-mess hall, the team at the polar station celebrated "Christmas" on June 21, and "Sunrise Day" on Sept. 23.

The latter is the date on which the sun officially rises again after the months-long winter night although a kind of eerie twilight prevails for several weeks before.

Although the two tunnelled entrances to the buried camp were blocked by snow during the winter, meteorologists several times a day squeezed through escape hatches to check on instruments scattered over several acres. Rope lines guided them back to camp when the wind whipped the snow.

Weather balloons were launched to heights of 35,000 feet twice a day. Geophysicists regularly traversed a narrow 1,000-foot-long tunnel to check on geomagnetic instruments which have to be kept isolated from iron and other metals.

Dr. Philip K. Swartz of Napa, Calif., a physician, is presently in charge of the camp although his relief, Dr. Malcolm Lentz of York, Pa., is among the new arrivals.

South Pole Gets Old Photo

CHRISTCHURCH, N. Z., Dec. 8 (UPI)—A photograph taken at the South Pole fifty years ago was installed today in a place of honor at the United States scientific station there. Fredrik Bolin, a Norwegian newspaperman, presented it to the station. It is a picture of Olav Bjaaland and Oscar Wisting, two members of Roald Amundsen's pioneer South Polar expedition.

Sperm Whale's Yield

The sperm whale, when fully grown, may yield up to 145 barrels of oil. The oil is used for the lubrication of spindles and other light machinery.

QUAKES RECORDED IN SNOW TUNNEL

Seismographs at South Pole Spot 5,000 Disturbances

By HAROLD M. SCHMECK Jr.
The New York Times.

SOUTH POLE STATION, Antarctica, Nov. 15—At the far end of a 1,000-foot tunnel under the snow here lies one of the keys to the accurate spotting of earthquakes throughout the world.

Here are the pole station's three seismographs from which daily readings are sent to Washington as aids to the United States Coast and Geodetic Survey's world-wide service in locating epicenters—the centers of earthquakes.

Some 5,000 or more disturbances are registered from here yearly, but none apparently stems from the Antarctic itself. Spotted at intervals along the tunnel are other instruments from which daily readings are taken on the characteristics and fluctuations of the earth's magnetic field.

These contribute data useful in many fields including magnetic mapping, aurora studies and better understanding of the Van Allen Radiation Belts.

The reason for the tunnel itself is to keep the sensitive instruments as far as possible from magnetic and physical disturbances of the pole station.

Almost a fifth of a mile long, the tunnel has headroom ranging from more than six to scarcely four feet. It is so narrow a man's shoulders often touch both walls at once. John T. Lamping, 23-year-old seismologist here for the survey, has almost worn out the sleeves of his parka by scraping it against the hard snow.

Through thin spots in the tunnel's average top cover of four feet of snow a pale diffuse blue light filters through. The temperature stays close to minus 62 degrees Fahrenheit all year. In this bizarre, less-than-comfortable setting Mr. Lamping takes measurements valuable to many specialists.

Magnetic and seismological work has been in progress here and at Byrd Station 800 miles north since the International Geophysical Year. The National Science Foundation, which contributes financially to the projects, has said the location of stations at the Southern Hemisphere's apex has made it possible to define the location of previously unidentifiable earthquakes.

AMERICANS PLAN ANTARCTIC TREK

2 Vehicular Routes Mapped to Pole of Inaccessibility

By HAROLD M. SCHMECK Jr.

The New York Times.

SOUTH POLE STATION
ANTARCTICA, Nov. 15—Heavy vehicles that made an overland trek to the South Pole last year are being brought out of hibernation here for another traverse that may be even more ambitious.

This may include the first United States attempt to pass through the Pole of Inaccessibility at the heart of the Antarctic Continent toward Queen Maud Land and back to the South Pole. The route would trace a huge triangle of 2,500 miles or more through regions of the polar plateau never yet seen by man.

The Pole of Inaccessibility, at about 82 degree S. and 55 degrees E., is roughly 625 miles north of here in the direction of the Indian Ocean. It is the geographic center of the Continent. It was reached in 1959 by a Soviet expedition from Mirny, but the region to the west where American scientists may penetrate has never been explored. On the way detailed studies would be made, aimed at helping tell the story of the history, present characteristics and future fate of the ice cap that holds more than 90 per cent of the world's ice.

The Antarctic ice cap is believed to have a profound influence on weather and climate all over the globe. Many facts about it, including the question of whether the ice is growing or shrinking, have not been settled.

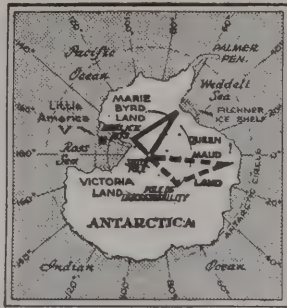
An alternate route to the Pole of Inaccessibility would be: north to the Horlick Mountains, eastward along their fringe toward the Filchner Ice Shelf on the continent's Atlantic Coast and then back to the geographic pole here to complete a 1,500-mile triangle.

In this trip scientists might locate precisely several peaks that have been disputed as to position since they were first seen fifty years ago by Ronald Amundsen who led the first expedition to the South Pole.

The trip might also fix the inland limit of the Filchner Ice Shelf, which has been found to project far deeper into the continent than had been thought.

The traverse is planned for next season, according to Jack P. Long, traverse engineer of the University of Wisconsin, because there will not be time this year to recondition the vehicles, plan and execute the trip. A choice between the two routes has not yet been made.

Mr. Long and James Filbert,



The New York Times

Nov. 19, 1961

POLAR TRIP: Dotted line shows planned traverse to the Pole of Inaccessibility. Solid line is alternate trek toward the Atlantic coast.

also of Wisconsin, have built a temporary garage here, have dug out the eight vehicles snowed in after completion of last year's traverse and are making repairs. They expect to have the work done in a month. Mr. Long, who has taken part in five Antarctic traverses including last season's McMurdo Sound-to-pole trek of almost 1,500 miles, said the new traverse might well be even longer, the 1960-61 traverse had excess fuel as it neared the pole and dumped some to lighten load. Thus the same vehicles next year should be able to venture farther. This summer some of the traverse equipment will be used for glaciology and related research near the pole. One point scientists hope to pin down is the depth of the ice.

Since adult penguins usually outnumber the chicks, there is spirited competition to adopt orphans and strays. Baby penguins are often killed in the fray.

MOVIES FREQUENT AT THE SOUTH POLE

But Amenities Are Balanced by Cold and Isolation

By HAROLD M. SCHMECK

The New York Times.

SOUTH POLE STATION
Nov. 17—They have a movie every other night at the South Pole.

They also have an automatic ice cream dispenser, a cozy "bar" called the Bamboo Room, a Lions Club and a record collection that would be the envy of many music lovers in the states. The cook served lobster for lunch today.

But these amenities do not mean that the United States Amundsen-Scott South Pole Station is a luxury post. There are other, more basic, facts of life at the South Geographic Pole. Among these is cold. The temperature averages 62 degrees below zero Fahrenheit over the year and sank, two months ago, to minus 102.

There is also hard work, up to sixty hours at a time, when supply air-drops are frequent, and the long polar night continues unbroken from mid-March to mid-September. There is physical isolation that can be as nearly absolute as men may ever experience on earth.

The station is a little cluster of box-like, windowless buildings, most of which are submerged in the surface snows of the great polar icecap.

Some betray their presence only by the white plumes of steam the heaters and diesel generators' exhausts throw up against the cold blue Antarctic

sky.

From the outside the base might look like a junk yard buried in snow drifts. The splidery structures of radio antennas, the round black dome of the radiosonde-tracking tower and a candy-striped "South Pole" flying the American flag, jar with this impression.

Like any other habitation of men, there is no single topic of conversation. Today it might be the portable fuel pump that broke down; the choice of a movie for tonight—they have a stock of over 300, some good, some incredibly bad—or the party held a few days ago for Charlie Wegner, the wiry, well-seasoned Navy cook who has served up good food day in, day out, for the last year with infinite good humor and infinitely salty language.

These days, however, there is one prevailing topic. This is the "relief" party, where it may be now, how soon it should reach Christchurch, New Zealand, from the states, how soon it will arrive here.

This schedule, largely unknown here, determines how soon the men who have lived all year at the Pole can leave and thus end the isolation, the routine and such restrictions as that permitting only one bath per man per ten days.

This is annual changeover time at the Pole. Replacements for the scientists and technicians of the United States Antarctic Research Program have not yet arrived. There has been much speculation as to how far they have progressed on the long route from the United States to the Antarctic.

The Navy replacements flew in on the last plane nine days ago. Indeed, the annual change of command ceremony was held Tuesday at the candy-striped pole as Lieut. Philip K. Swartz Jr. turned over responsibility to Lieut. Malcolm Lentz.

The word today is that another ski-equipped C-130 will fly in tomorrow bringing research replacements and permitting last season's scientific force to leave.

When the final C-130 lifts its huge bulk off the snow here in February and disappears toward the main United States Antarctic base at McMurdo Sound, isolation will return to this station at the Pole.

Penguin's Molting Season

Once a year penguins molt, standing alone in a fixed spot on ice or land, unable to swim, seemingly in misery. For nearly a month they neither eat nor bathe until finally fresh plumage equips them to cavort again in the sea.

Penguin Swims With Wings

The wings of the penguin lack quills and are incapable of flexure. They are used by the birds as paddles in the water and for fighting on land.

Lost Plane Is Guided To Camp in Antarctica

McMURDO SOUND, Antarctica, Nov. 18 (AP).—A United States Navy Hercules cargo plane tracked down a smaller plane lost over an ice mass as big as California last night and guided it to a safe landing at a remote weather station.

The Hercules, piloted by Lt. R. F. Carlson of Milton-Freewater, Oreg., was on a return flight to McMurdo Sound from the South Pole when it picked up a distress call from the smaller Navy Otter somewhere over the Ross ice shelf.

The Otter pilot, Lt. Ron Bolt, radioed that he had become lost on a flight from McMurdo

to the weather station on isolated Breadmore glacier and was running out of fuel above the heavily crevassed wasteland.

Howard H. Murray of Atlanta, aviation machinist's mate, the Hercules flight engineer, spotted the Otter about an hour after the search started. Lt. Carlson escorted it to the weather camp 120 miles away, where Lt. Bolt landed with about a 10-minute fuel supply remaining.

"Thanks," Lt. Bolt radioed Lt. Carlson. "I certainly do appreciate this."

"No sweat," answered the Hercules pilot. "Buy me a brew some time."

"Soon as I get back to McMurdo," Bolt promised.

Icebreaker Crunching Its Way to Antarctic Base

By HAROLD M. SCHMECK Jr.
The New York Times.

ABOARD the U.S.S. GLACIER, off Antarctica, Nov. 20—The mighty Glacier, the Navy's largest, most powerful icebreaker, has smashed and cut her way to within seven and one half miles of her first destination on the Antarctic mainland.

She and two smaller icebreakers, the Eastwind and the Burton Island, are convoying a tanker and another cargo vessel to the main United States Antarctic base, the naval air facility McMurdo on McMurdo Sound. They expect to bring the ships in earlier than a convoy has ever before reached this base.

There is much at stake in the effort. The tanker Chattahoochee is carrying 1,000,000 gallons of badly needed fuel—aviation gasoline, jet and Diesel fuels. The United States Antarctic program faces a severe shortage of aviation fuel, one of the crucial limiting factors on which the whole broad research program rests. It is hoped that the tanker can be brought in early to relieve the situation. The other convoyed vessel, the Mizar, is carrying a general cargo of high-priority supplies and equipment destined to be airdropped at outlying United States Antarctic bases after unloading at McMurdo.

The Glacier left Port Lyttleton, N. Z., Nov. 9. She has been battling ice in the lead of the convoy for the last 600 miles. Two days ago the ships reached thick, solid bay ice that stretches from Cape Royds all the way into McMurdo, about twenty miles.

The glacier, cutting the first channel, is now about abreast of two black grags sticking out of the ice that are called Inaccessible and Tent Islands. The icebreaker is within thirteen and one-half miles of Hut Point, near McMurdo, where the Mizar will unload. It is planned, however, to unload the tanker six miles out from the base, using pipe lines that will be laid across ice to McMurdo. Comdr. Edward G. Grant, the Glacier's captain, estimates the tanker can be brought in by Sunday for unloading. The Mizar should be unloaded by Nov. 30.

Capt. Edwin A. McDonald, commodore of the convoy and an old hand at Arctic and Antarctic icebreaking, said he believed this would be the earliest convoy ever to reach McMurdo, although the Glacier, operating alone, had once or twice come in earlier. For ice



USS Glacier in the icepack

and weather conditions, he said, this has been the best year in his Antarctic experience.

For two days now, the Glacier has been carving a channel through the ice over four feet thick. It is expected to get several feet thicker. The other icebreakers are behind her, cutting diagonally to convert the first path into a wedge that will be five miles wide off Cape Royds and that will narrow to a few hundred feet off Hut Point. This is the heavy slugging match in the Glacier's duel with Antarctic ice. The 8,600-ton vessel thrusts forward into the ice, backs off two ship lengths and rams forward

again until the ice drags her, to a stop after a gain of perhaps 150 feet. She backs off again and comes on once more, slugging first to the right, then to the left, sometimes in the center of the channel, opening a path about twice as wide as the vessel's beam of seventy-four feet.

It makes for rough riding. When the glacier churns forward under nearly her full 21,000 Diesel-electric horsepower her armored bow rides up and crunches down through the ice. The whole ship jolts and throbs. It feels a little like a commuter train jolting into a station, but on a massive scale.

JAPAN LEADS WHALING.

Her Fleet in Antarctic Will Be Largest for First Time

LONDON, Dec. 19 (Reuters)—Japan for the first time will have a larger whaling fleet than any other nation in Antarctic waters next season, the International Whaling Commission said here today.

Japan will send eight expeditions, each comprising a factory ship and a fleet of catchers. Norway, the leading whaling nation in the past, will have seven factory ships, the Soviet Union four, the Netherlands three and Britain two, the commission said.

A spokesman for the commission said whale conservation at present is in "unhappy straits." "There is grave concern on the state of the whale stocks," he said.

SHIPS REACH M'MURDO

Icebreakers Pave Way for Two Supply Vessels

SEATTLE, Dec. 13 (AP)—Three icebreakers led a cargo ship and tanker into McMurdo Sound Nov. 25 with badly needed supplies for the United States base.

A delayed report today said the cargo vessel Mizar and the tanker Chattahoochee had reached the Antarctic coast a month earlier than any other surface ship in history. The report was received at Thirteenth Naval District Headquarters.

The icebreakers smashed through ice up to eight feet thick. They were the Seattle-based Burton Island, Eastwind and Glacier.

ATOM POWER PLANT AT ANTARCTIC BASE

The New York Times.

WASHINGTON, Dec. 14—The atomic age arrived at the ice-bound continent of Antarctica today, fifty years to the day after Roald Amundsen became the first man to reach the South Pole.

Aboard the Navy transport Arneb as she steamed into McMurdo Sound was the first atomic power plant for the Antarctica. The prefabricated plant, built for the Atomic Energy Commission by the Martin Marietta Corporation of Baltimore, will be installed in a plateau overlooking the American base at McMurdo Sound.

The reactor will supply 1,500 kilowatts of electricity—five times as much electricity as available at present to the base from Diesel generators. In addition, it is expected to lay the basis for other nuclear power plants in the Antarctica, and thus ease the problem of hauling in Diesel fuel to the remote bases.

Also aboard the Arneb was an automatic weather station, powered by an atomic battery fueled with radioactive strontium. It will be flown to the abandoned United States station at Little America V, about 400 miles from McMurdo Sound, to record automatically weather observations and periodically transmit the information by radio to McMurdo.

ANTARCTIC VEHICLES TO BE RECONDITIONED

The New York Times.

McMURDO SOUND, Antarctica, Nov. 18—Vehicles that have been buried in snow for several years are to be reconditioned at Little America 5 for a six-man expedition to reopen the surface trail from that base to Byrd Station about 640 miles inland to the east.

This will open a useable trail all the way from Little America to the South Pole, since the final 800-mile leg of that route was traveled last season by a scientific traverse.

Little America 5, inactive since early 1959, is across the Ross Ice Shelf from McMurdo, the main United States Antarctic base.

Four men were landed there today by air to set up tents and start digging out a big forty-four ton tractor and two smaller vehicles.

When these are in working condition they will carry the full party to an inland weather station 240 miles away called Little Rockford.

SCIENTISTS START A 1,200-MILE TREK

Trace the Course of Trench
That Cleaves Antarctica

WASHINGTON, Dec. 9 (AP)—Seven polar scientists, using tracked Sno-Cats to plow across a massive ice sheet, have set out on a 1,200-mile expedition through a largely unexplored part of Antarctica.

One aim of their mission is to trace the course of a deep trench that cleaves the polar wastes. The scientists also want to learn more about the Antarctic ice coating.

The National Science Foundation announced yesterday that the expedition got under way last Friday. The report, relayed here from McMurdo Sound, was delayed.

The team of scientists, their supplies and vehicles were airlifted by ski-equipped planes 1,500 miles to their base, Camp Minnesota, from the Navy base at McMurdo.

Camp Minnesota was occupied last year by a University of Minnesota geological party and also served as the end-point of a traverse made by a University of Wisconsin group. But before the isolated camp could be used this time, it had to be found again. It had been buried by drifted snow.

The exploration led by Dr. John C. Behrendt, University of Wisconsin Geophysicist, is expected to last two and a half months. It will refuel when it stops at Sky-Hi base in about one month, the dispatch reported.

A few weeks later a plane will deliver more fuel for the Sno-Cats at Sweeney Mountains. These are the only times the scientists are expected to come in contact with any other people during the trek.

The overland trip—in Ellsworth Land near the base of the Palmer Peninsula—is designed to "learn more about the behavior and thickness of the massive ice sheet that covers the Antarctic continent and about the nature of the underlying rock surface," said the foundation report.

Of special interest will be an attempt to trace the course of the deep trench that extends below sea level from the Ross Sea and well into Ellsworth Land.

This trench is estimated to be some 2,000 feet deep—knifing at least 1,000 miles across the continent under up to 6,000 feet of ice. Where and how far it goes from there across the continent is not yet known.

Some scientists say that if it should turn out that it extends as far as the Weddell Sea—on the opposite coast of Antarctica from the Ross Sea—it might mean that South America's

Ship Is Outfitted for Antarctic

Floating Laboratory
to Cruise for a Year
Off the Continent

By WALTER SULLIVAN

A ship is being outfitted on Staten Island as this country's first vessel designed exclusively for polar research.

About Feb. 1 she is to set sail for Antarctica. She will spend the next year steaming back and forth along north-south lines from 600 to 1,000 miles in length. Each thrust to the south will terminate where the pack ice becomes difficult of passage.

The lines are to be spaced 125 or 130 miles apart. The project has been divided into five cruises of about two months, separated by periods of about one week each in Valparaiso, Chile.

The ship will conduct observations of the water and the ocean floor beneath it, of marine life at all depth down to several miles, of the turbulent atmosphere overhead and of phenomena in space beyond. On board, a half dozen laboratories are being outfitted for some thirty-two researchers.

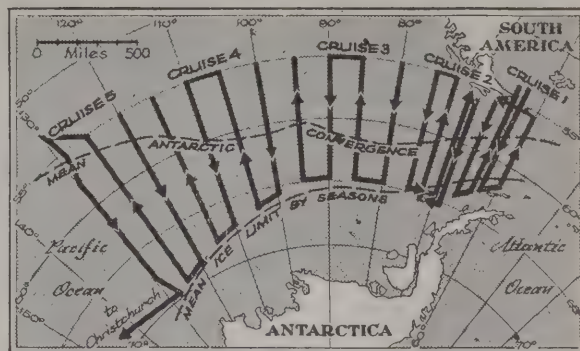
Participants in the initial one-year program include five universities, one college, a research foundation and a museum. The ship is being converted for the National Science Foundation at a cost of more than \$1,000,000. She will be operated by the Navy's Military Sea Transport Service.

The ship, named the *Eltanin* for a navigational star, was built in New Orleans as the first of a new class of ships designed to resupply the Arctic radar stations. Completed in 1957, her bow is cut back so that the ship will ride onto ice instead of hitting it. The vessel has double bottoms, but is not designed for battling heavy pack ice.

After the *Eltanin* and two sister ships had been built, it was decided to rely on lightering for unloading cargo at the

Andes Mountains, believed by some scientists to extend into Antarctica, may actually stop before reaching the continent, and that all Antarctic mountains are entirely independent chains.

Others in Dr. Behrendt's party were identified as Perry E. Parks Jr., assistant geophysicist, Lee W. Krieling, traverse engineer, both of the University of Wisconsin; Conrad G. Merriek, topographic engineer for the United States Geological Survey; Peter J. Wasilewski, geomagnetician from the United States Coast and Geodetic Survey; Hiromu Shimizu, Japanese glaciologist attached to Ohio State University, and John R. T. Molholm, assistant glaciologist from Ohio State University.



The New York Times

Dec. 10, 1961

Black line shows plot of new research ship's planned course

Arctic stations. These craft were not well suited to such unloading, but the *Eltanin* seems to be ideally suited for her new role.

With a deadweight tonnage of 1,850, the ship is considerably smaller than the huge Soviet research ships such as the *Ob*, *Lena* and *Lomonosov*, which run to 12,000 tons or more. Many American oceanographers, however, believe that several smaller ships would be more productive than a large one.

The *Eltanin* carries a crew of about fifty. She has a helicopter flight deck, but will not carry such a craft on next year's voyage south. Below the deck a hangar has been built where weather balloons can be inflated. A grill balcony protrudes over the ship's wake onto which men can run as they emerge from the hangar with the balloon.

The ship bristles with strange-looking antennas and other devices. In fact so much gear has been added to her superstructure that she is undergoing special stability tests to make sure she is not top heavy. A railroad has been temporarily set up athwartships so that a car laden with weights can be rolled from one side of the ship to the other.

The response of the ship to this weight-shifting can be used to calculate where her center of gravity lies. In mid-January it is hoped to take the ship to sea and hunt out a severe storm. Her performance in heavy waves will then be studied, for the seas where she is to operate are reckoned the stormiest in the world.

The ship is equipped with a system of tanks designed to limit her rolling, which otherwise could make it almost impossible, on so small a craft, to get much done in the laboratories. Meanwhile, a model of the ship is being tested in a model basin. One of the primary jobs still to be done is the installation of a huge winch for lowering devices to the sea bottom in water several miles deep.

The ship is now at the yard of the Brewer Dry Dock Com-

pany at Mariners Harbor, S. I. Already on board is a massive device to count cosmic ray mesons for the Bartol Research Foundation of Swarthmore, Pa. Likewise there are special antennas to record "whistlers" and other low frequency radio phenomena.

The latter observations are of special interest, since the area of the ship's projected operations lies on the lines of magnetic force that arch out into space and then return to earth in the United States. The manner in which low-frequency radio signals, as well as some radar signals, follow such lines of force is an area of special current interest. This study is being supervised by Stanford University in California.

The Lamont Geological Observatory of Columbia University is to study sea bottom samples brought back by the ship. The University of Southern California is doing the marine biological program. The Bernice P. Bishop Museum of Hawaii is sponsoring the collection of airborne insects. Other participants include the University of Wisconsin, Florida State University and the Texas Agricultural and Mechanical College.

Texas Instruments, Inc., has contracted to provide an additional team of six, including a fisherman from Maine, to haul in nets, run the electronics and machine shops and do over-the-side specimen collecting.

Antarctic Mission Completed

McMURDO SOUND, Antarctica, Dec. 4 (Reuters)—The United States' "Operation Deepfreeze" has completed a major air-supply operation to establish a new scientific station on the remote unexplored Ellsworth Highland of western Antarctica. A Navy Hercules plane returned yesterday from a 3,200-mile round trip delivering fuel and supplies.

Arctic Falcon

One of the few types of falcons in Canada, the large gyrfalcon, is found throughout Arctic regions.

SYMMETRY FOUND IN POLAR 'LIGHTS'

Area of Auroral Displays Is
Pinpointed by Scientists

By HAROLD M. SCHMECK Jr.
The New York Times.

MELBOURNE, Australia, Nov. 30—Australian scientists believe they have determined the precise geographical symmetry of auroral displays in the Southern Hemisphere.

They expect the work to prove valuable in planning radio broadcast circuits throughout the Antarctic and probably the Arctic as well. The latter might be of particular practical value in view of the concentration of United States and Canadian defense installations in the Far North.

The Australian research should allow scientists to choose more definitively among the many theories that have been advanced to explain the details of the process from which auroral displays arise, according to Dr. Fred Jacka, principal author of the study.

Auroras, the so-called Northern and Southern Lights, have always been objects of wonder and curiosity. Some times appearing as vast shimmering curtains of light, at others as huge arcs of flame, they can be awe-inspiring sights in polar latitudes.

It is now almost universally agreed that they are ultimately caused by radiations from the sun, but this still leaves a great deal of room for debate as to the important details of the process.

The auroral study just completed here consisted of a painstaking analysis of visual and photographic observations of the Southern aurora taken throughout the entire eighteen months of the International Geophysical Year. Regular nightly observations from some twenty-two stations, most of them in the Antarctic or on near-by islands, were analyzed.

The key finding from this research, Dr. Jacka said, is that the line of maximum auroral frequency is remarkably symmetrical with respect to a fairly refined conception of earth's magnetic field.

Auroral displays are frequently associated with poor radio communications conditions. Because the research allows prediction of auroral display frequency at any point within the broad auroral zone, the findings should prove valuable to radio men, in the opinion of Dr. Jacka. He is chief scientist of the Antarctic Division of Australia's Depart-

Ionosphere Base Set Up by U.S. on Antarctic Icecap

WASHINGTON, Dec. 6.—

Capping a feat of aerial logistics, the United States has established a new scientific station in a remote area of Antarctica.

This was reported yesterday by the National Science Foundation on the basis of a radio dispatch from its Antarctica headquarters at McMurdo Sound.

The new station, called Ski-Hi, was set up Sunday in a formidable area of ice-capped terrain lying between the Palmer Peninsula and the Sentinel Mountains. It is 700 miles from this nation's Byrd Station and 1,500 miles from coastal McMurdo.

It is designed to make new measurements of the earth's magnetic field and of the ionosphere—the layer of electrified air that plays a key role in terrestrial radio communications.

Manning Ski-Hi Station will be five scientists: William F. Johnson, station leader, and Charles S. Neuner, both of the U. S. Weather Bureau; Lindsay P. Caywood jr., U. S. Coast and Geodetic Survey; and Stephen S. Barnes and Gordon W. Angus, of the National Bureau of Standards.

ment of External Affairs.

Because the line of maximum auroral frequency appears closely and precisely tied to such a fundamental thing as the earth's magnetic field in the Southern Hemisphere, it seems highly reasonable to suppose that the same relationship holds true in the North as well, Dr. Jacka said.

He and Fred Brown, a co-worker in the division, have found auroral displays symmetrical not with the magnetic pole, nor with the geomagnetic pole, but with a third and somewhat more refined expression of earth's magnetic field. This is called the eccentric dipole axis.

The position of the magnetic pole, the region where a compass needle should point straight downward, is influenced by materials in earth's crust. The geomagnetic pole is a more precisely defined point determined by considering earth's magnetic field, in much simplified form, as a bar magnet or dipole thrust through earth's center, its emerging ends constituting the geomagnetic poles. This is only a rough approximation of the actual configuration of the field, however. A somewhat closer approximation is achieved, Dr. Jacka said, by displacing this hypothetical bar

Bacteria Left in Antarctic in '17 Found Alive Under Frozen Snow

By HAROLD M. SCHMECK Jr.

The New York Times.

MCMURDO SOUND, Antarctica, Nov. 21—Bacteria left in Antarctica by the historic expeditions of Scott and Shackleton have been found still alive after nearly half a century.

Under the patient tending of Dr. George H. Meyer, microbiologist of the University of Texas, the microbes have regrown into flourishing bacterial colonies.

Although they were extremely slow growing when he started, they have regained the vigor normal to their types. It seems virtually certain, Dr. Meyer indicated today, that the original bacteria recovered here had once lived in the digestive tracts of some of Scott's and Shackleton's men or, perhaps, of even the famous explorers themselves.

The bacteria have been grown from samples obtained at Sir Ernest H. Shackleton's hut at near-by Cape Royds and at Cape Evans.

The history of the sites and the fact that the samples were recovered from beneath at least two feet of hardened snow seem to rule out the possibility that the bacteria could have been left at the sites more recently than 1917 some forty-four years ago.

Dr. Meyer said he knew of no other case in which such bacteria had survived for periods even approaching this span of time. In the laboratory technique called lyophilizing, or freeze-drying, designed to preserve microbes for long periods of time, bacteria tend to die out in a few years, he said. Even under optimum growth conditions in the laboratory, bacterial cultures usually lose their vitality and die out in six or seven years, he said. Yet here, bacteria have been recovered that must, under the circumstances, have lain in a

state roughly equivalent to dormancy since 1917 at the latest.

For viruses to have survived so long might not be considered surprising. Viruses are thought of as lying on the border line between living and nonliving things. They are known to survive inertly for long periods. To multiply, however, they must act as parasites of living cells. Bacteria are living organisms, having their own complex metabolism, taking food from their environment.

Dr. Meyer said he had no idea how the bacteria he had found had survived so long with only the substances within the individual bacterial cells available for food. Ice crystals and frozen matter surrounded the numerous individual bacteria.

This seemed to rule out the chance that the microbes were living off substances in their environment. This, and the absence of whole colonies of bacteria in the samples, rule out the possibility that the bacteria had been actively growing and multiplying under the snow.

Bacterial types identified so far include *Escherichia coli* a *Bacillus subtilis*, both of which are normal residents of the human digestive tract. Some other surviving types have not yet been identified, nor has the study progressed far enough to determine whether the bacteria are normal or aberrant forms.

The samples were taken from human waste that had been disposed of at the hut sites. The discovery of viable bacteria in these samples carries absolutely no implication that the men of the expeditions were carrying disease, nor that there is any present danger of illness from this source.

magnet slightly so that it does not pass through the earth's center. This is called the eccentric dipole axis.

The southern pole of this axis is at 75 degrees S., 120 degrees E., about 175 miles east of the geomagnetic pole. The line of maximum auroral frequency, according to Dr. Jacka's analysis of all the pertinent I. C. Y. data, is the entire line constituting Lat. 69 degrees S. considering the eccentric dipole axis "pole" as 90 degrees S.

On this circle auroral displays seem to come during virtually every suitable observation period, Dr. Jacka said. The frequency drops off gradually both to the north and south of the line; the decline being more abrupt in the direction of

the equator.

Dr. Jacka said the analysis could also be interpreted as showing the auroral maximum symmetrical around the polar belt in which electrons from the outer Van Allen belt might be predicted to "precipitate" downward into the upper atmosphere. This is an interpretation that hints at the Van Allen radiation as a direct causative factor in auroral and related events.

Polar Bear's Overshoes

Unlike other bears, the polar bear has fur overshoes which protect the soles of his feet . . . his sight is better . . . and he has an extraordinary sense of smell.

POLAR PENINSULA WORLD'S LONGEST

Antarctic Promontory Tops
Italy, Photos Disclose

By WALTER SULLIVAN

The New York Times.

HONOLULU, Aug. 23—The long arm of Antarctica reaching toward South America has been found, in aerial photographs, to be 200 miles longer than previously supposed.

This makes it more than twice as long as the Italian peninsula and by far the longest promontory in the world.

It also appears that a compromise is at hand in the naming of this great geographical feature. This would bring to an end one of the most bitter controversy of the kind in the history of modern exploration.

The term, which has gained wide favor among scientists and geographers concerned with the Antarctic, is the Antarctic Peninsula. On present maps five titles are used, four of them with strong national overtones. American maps call it Palmer Peninsula in honor of the young man who, American scholars have said, was the discoverer of the continent.

The British call it Graham Land, after an Englishman, and insist the continent was discovered by a British expedition. Chile calls it O'Higgins Land and Argentina has called it San Martin Land. O'Higgins and San Martin having led those two nations in their fight for liberation from Spain.

However, at the symposium on Antarctica held here this week as part of the Pacific Science Congress, the scientists, almost without exception, used Antarctic Peninsula and an Argentine map was displayed with that term on it. It is understood that adoption of the compromise name was discussed informally at the recent Antarctic conference, in Canberra, Australia.

In attendance were representatives from the twelve nations that have signed a treaty making the continent a laboratory open to scientists from all lands. Any change in the designation on American maps would have to be approved by the Board on Geographic Names of the Department of the Interior. However, at least some members of the board are in favor of the change.

At one point, prior to World War II, a leading American scholar accused the British Admiralty of willful deception, and the British responded with corresponding heat. A monograph on the subject by the American was bound by a British authority on Antarctica



The New York Times

Aug. 27, 1961

GROWING CONTINENT: New Antarctica map by two University of Michigan professors shows Antarctica Peninsula (upper right) to be 200 miles longer than believed.

with a rattlesnake inscribed on the cover.

During the Battle of Britain, however, the American relented and sent his British colleague a food parcel, whereupon the latter sent the monograph back to the bookbinder and had a halo inserted above the snake's head. The volume is now at Cambridge University.

The discovery that makes the Antarctic Peninsula the largest in the world is the vast extent of the Filchner Ice Shelf. Its known size has been growing by leaps and bounds as a consequence of the exploration of the International Geophysical Year of 1957-58 and the years that have followed.

This has convinced those who have flown over the region, such as Dr. Edward Thiel of the University of Wisconsin, who participated in this week's symposium, that the seaward cliffs of the Sentinel Range drop directly into a portion of

the Weddell Sea covered by the Filchner Ice Shelf.

The waters of the South Atlantic thus reach in, through the Weddell Sea, and bite deep into the continent at the root of what is now shown to be a 1,200-mile-long peninsula. The only other such feature of comparable length is the Malay Peninsula, which is some 1,000 miles long.

Further evidence that the floating apron, known as the Filchner Ice Shelf, penetrates fiord-like into the continent has been found in aerial mapping photos under analysis by the United States Geological Survey. The first examination of photos seaward of the mountains showed the snow surface to be below sea level, according to informants here. This has now been revised to show the snow as lying on a floating shelf.

Another major naming problem concerns the two distinct "provinces" of the Antarctic. One is the great, rounded region that embraces the South Pole and lies predominantly in the Eastern Hemisphere. The other, lying entirely in the Western Hemisphere, is dominated geologically by the Antarctic Peninsula, which structurally is a continuation of the Andes Mountains of South America.

The former is frequently referred to as East Antarctica and the latter as West Antarctica. Some, however, prefer expressions such as "Greater" and "Lesser" Antarctica.

The new discoveries give the Filchner Ice Shelf an estimated area of 330,000 square kilometers, a kilometer being six-tenths of a mile. The only comparable feature is the Ross Ice Shelf whose area is put at 540,000 square kilometers.

SCIENTISTS HONOR A POLAR PIONEER

Antarctic Experts Gather at
Symposium in Honolulu

By WALTER SULLIVAN

The New York Times.

HONOLULU, Aug. 22—Scientists from many lands met here today to mark the 100th anniversary of the first proposal for international exploration of Antarctica and to compare notes on the fruits of subsequent efforts.

The man they honored was Matthew Fontaine Maury, an American naval officer, who participated in planning for carrying out expeditions to both polar regions.

Only recently have his efforts on behalf of international scientific exploration become generally recognized.

His activities were outlined this morning to Antarctic specialists gathered from as far afield as New Zealand and the Soviet Union by Dr. Harry Wexler, director of meteorological research at the United States Weather Bureau.

The Maury Memorial Symposium, convened under Dr. Wexler's auspices, was one of the opening events of the Pacific Science Congress being held here at the University of Hawaii.

On April 10, 1861, Dr. Wexler reported, Maury dispatched letters on behalf of the United States Government to the ministers in Washington representing Portugal, Italy, the Netherlands, Spain, Britain, France, Russia, Brazil and Austria proposing in detail an international program of Antarctic exploration.

He set forth the arguments for a multi-nation effort—less financial burdens on any one nation, greater geographical coverage and the stimulus of competition.

"The officers and men under each flag," he said, would "strive so much the more earnestly not to be outdone in pushing on the glorious conquest."

Hardly had he presented his plan than the Civil War broke out. Ten days after dispatching his letters he resigned and returned to his native Virginia to fight for the South.

Large-scale international exploration of Antarctica had to wait almost a century before it came to fruition in the International Geophysical Year of 1957-58 and the programs that followed it.

Hole Blown in South Polar Ice

AUCKLAND, New Zealand, Dec. 19 (AP)—American scientists have blown a big hole in the ice near the South Pole in an attempt to find the depth of the Antarctic ice cap.

Name Change For Falklands

LONDON (AP).

Britain has decided to change the name of its Falkland Island dependencies in the Antarctic, which also are claimed by Argentina and Chile, government sources reported Oct. 10. They said the dependencies will be known as British Antarctica starting next year.

The Foreign Office here was said to have advised Argentina and Chile authorities informally of the British intention.

there. They blew a crater 25 feet deep and 75 feet across yesterday with 1,600 pounds of explosive planted under the snow a few yards from the geographic pole.

SOVIET TO SURVEY EAST ANTARCTICA

Geologists to Explore Area
Never Visited by Man

The Soviet Union's seventh Antarctic expedition will trek to central portions of the continent never visited by man, Tass, the Soviet press agency, said Nov. 4.

The Soviet explorers will make an extensive geological survey of eastern Antarctica.

The expedition will be under the command of Aleksandr Dral'kin, a geographer who has already taken part in several Arctic and Antarctic projects and has been awarded the Order of Lenin, Tass said.

The Soviet party, which will travel in two ships, will number 300 persons, including crews. A group of nearly 100 will remain at bases throughout the Antarctic winter.

According to the agency, one of the ships, the Ob, will leave Leningrad in mid-November, followed two weeks later by the Kooperatsiya. They will carry a total of 3,000 tons of supplies and construction, transportation and scientific equipment.

Members of the party will continue astronomical work in the observatory at Mirny and at the inland stations of Vostok and Novolazarevskaya. The Komsomolskaya station will be the jumping-off point for the central Antarctic exploration.

Oceanographic observations will be undertaken in large areas of the Indian Ocean near the Antarctic coast.

NEW 'POLE OF COLD' LIVES UP TO NAME

Russians at Antarctic Base
Cite Effect on Health

CANBERRA, Australia (NANA)—A party of Russian scientists at a new "pole of cold" is living through the world's coldest temperatures, dropping to 126 degrees Fahrenheit below zero.

The fantastic low readings are being experienced at a tiny scientific base, Vostek, 2,000 miles due south of Australia, according to a report released here by the Soviet Embassy.

The report came from Dr. Eugenii Tolstikov, who with Dr. Mikhail Semey was one of the leaders of the Soviet expedition which has been active at Mirny and other Soviet Antarctic bases since 1956.

Most of the Russian research in Antarctica is being conducted in an area that is claimed by Australia as polar territory.

August was the coldest month at Vostek, 400 miles inland and the worst spell was experienced August 23-24 just as the sun appeared over the horizon at the end of the long dark polar night.

The lowest ever reading at the pole of cold is minus 126.94 degrees.

In the extreme cold the Russians find that metal becomes brittle, diesel oil turns into a doughlike mass, paraffin oil freezes, while petrol will not catch fire even when a burning torch is put to it.

The Russians state that healthy men can adapt themselves to the conditions, but in the oxygen-deficient high altitude of the polar plateau they first have to go through a painful acclimatization period lasting from fifteen to thirty days.

During this period the Russians suffer from headaches, sharp, short windedness even when resting, nausea, bleeding nose, and palpitations.

Blood pressure also lowers sharply. Besides heavy protective clothing headgear and footwear, they use special face masks with heaters in them to prevent the freezing air reaching their lungs.

The average year-round readings of minus 70.6 degrees Fahrenheit at Vostek and the other inland stations of Soviet-skaya and the pole of relative inaccessibility (both unmanned in winter) make them the coldest places in the world, the Russians assert.

Mining in Spitsbergen

The major industry of Spitsbergen, an Arctic island group 400 miles north of Norway, is coal mining. Most of the islands' 2,000 inhabitants are miners.

EARTHQUAKE CYCLES PUT AT THREE YEARS

WELLINGTON, New Zealand (Reuters)—A theory of three-year cycles for large-scale earthquakes was put forward here recently by an American Antarctic scientist, Dr. Paul A. Siple.

Dr. Siple, who is visiting academic and scientific institutions, said that it would probably be a long time before seismologists could predict the time and the place of major earthquakes, but that the recognition of a three-year cycle was a beginning.

Minute changes constantly take place in the earth's spin at the poles—there are actually several poles within a few feet of each other—and create strains in the earth's crust, Dr. Siple said.

The strains build up over a three-year period when earthquakes are comparatively quiet. Then follows a second three-year period when balance is restored and major upheavals can be expected in earthquake-prone areas, he said.

Dr. Siple said December, 1960, marked the end of an active three-year cycle and the next three years should be comparatively free from major upheavals.

ANTARCTIC TREK MADE

Britons Reach Tottan Ranges,
304 Miles From Base

LONDON, Dec. 18 (AP)—Two Britons have succeeded in making the first land approach to the remote Tottan ranges in the Antarctic, the Colonial Office said tonight.

Colin Johnson, 31 years old, of London, and Dennis Ards, 24, a glaciologist from Newcastle, radioed that they had reached the mountains after a 304-mile trek from Halley Bay.

The mountains, two ranges about fifty miles apart, have been seen by aviators, who estimated that some peaks reached 9,000 feet.

The radio message from Mr. Johnson and Mr. Ards said they believed the route they had covered could be used by tractors and that well-equipped expeditions with heavy gear could penetrate the region to make scientific studies.

Mr. Johnson and Mr. Ards made observations for three days at the point of their deepest penetration and are now on their way back to Halley Bay.

Russians Off to Antarctic

LONDON, Dec. 15 (Reuters)—The seventh Russian Antarctic expedition left Moscow by air today for Antarctica, the official Soviet news agency Tass reported. The group, led by Mikhail Ostrekin, geophysicist, includes scientists from the Arctic and Antarctic Research Institute.

ANTARCTIC SEAS RICH IN WILDLIFE

**Copious Flora Feeds Birds,
Fish, Seals and Whales**

WASHINGTON—Earth's richest pastures surround the earth's most hostile land—the vast antarctic Sahara of snow and ice.

The continent itself is cold and sterile. Covering an area newly as big as Europe and Australia combined, it nurtures practically no plants and thus few animals. It contrasts starkly with its polar sister, the Arctic, where an extensive tundra supports about 400 species of flowering plants and ferns, which, in turn, feed an abundant animal life.

But Antarctica's icy seas spawn flora so copious that they abound with a large population of fish, birds, seals and whales, some of which consume more than a ton of food a day, the National Geographic Society says. Plant life in the waters ringing the continent is so thick that visibility is only one-third that in warm, central Pacific waters.

Scientists attribute the astonishing fecundity to the upwelling of the water from the ocean floor in shallows fringing the continent. The upsurge brings nitrates and phosphates from decomposed plants and animals to fertilize the ocean garden.

Combined with the high oxygen content of the cold water, the nutrients sustain a huge crop of microscopic plants that are food for microscopic animals. The tiny animals are eaten in turn by invertebrates such as red krill and opossum shrimp, a staple of larger animals.

The biggest creatures in nature's antarctic chain are whales, and the biggest of all is the blue whale, a monster that reaches 100 feet and weighs up to 150 tons. It is the largest animal ever known.

But the most notorious is the killer whale, a mottled carnivorous animal that travels in a pack of twenty or more. It seems to take pleasure in tumbling a sleeping seal off its icy perch and devouring it. Though only thirty feet long, it will even attack the giant blue whale.

Several other species of whales cruise antarctic waters. Whaling expeditions aboard factory ships that can process the animals in assembly-line fashion push to these extreme southern waters to hunt every year.

Common on Antarctica's icy beaches are several species of seals. None has any great commercial value. The only fur

seals that inhabited the region were nearly annihilated for their coats within a few years after man's arrival on the continent. A few have recently reappeared on subantarctic islands, and some scientists believe that the population may be restored by the end of the century.

The best known citizen of the Antarctic is the penguin. Eight species make their homes there. The most southerly are the Emperor, about three feet high, and the Adelle, about two feet high. These appealing and curious birds, which greet arriving ships and extend to human visitors the only semblance of native hospitality on the bleak continent, live in immense rookeries of perhaps a million.

Other birds that frequent Antarctica are the albatross, petrel, whale bird, skua, tern and gull. All are dependent on the sea.

CANADA SENDS OBSERVER

Officer Joins Argentine Cruise to Antarctic

A Royal Canadian Navy officer, Lieut. Comdr. Neil St. C. Norton, was recently appointed an observer with the Argentine Navy for a four-month cruise in the Antarctic, reports the Canadian Weekly Bulletin, an official publication.

The appointment was made in response to an offer by the Argentine Navy to permit a Canadian officer to accompany the expedition.

The expedition is in two phases. The first will be concerned with ice penetration, while the second will be taken up with Antarctic scientific work.

Lieut. Comdr. Norton is a navigation specialist and a hydrographer.

Soviet Flight to Antarctica

MOSCOW, Dec. 25 (AP)—One of two Soviet planes that flew from Moscow to Antarctica reached the Russian base at Mirny today, Tass, the Soviet press agency, reported. The plane, an Antonov 10 four-engine turboprop, first landed at the United States base at McMurdo Sound and then flew on to Mirny with twelve members of the Soviet expedition to Antarctica. The second Soviet plane still is at McMurdo.

Aussies Explore Pole

CANBERRA (UPI).

An eight-man Australian team has left the Antarctic base at Mawson on a two-month expedition across the icecap to the interior of the South Pole region, the government has announced.

Whales' Sea Food

Plankton, the microscopic plant and animal life in the oceans, is the sole food of the largest whales and of many fish.



LAST ANTARCTIC VOYAGE: Friends and relatives wave farewell as the Soya, 4,866 tons, sets sail from Tokyo on its last voyage to the Antarctic to pick up the wintering party at Showa Base, Ongul Island. About 1,000 people turned out to wish the Soya and its crew "bon voyage" when it sailed.

Asahi Shimbun

Soya Sails From Tokyo On Last Trip to Antarctic

TOKYO, Oct. 30

The Soya sailed from Tokyo today on its last voyage to the Antarctic.

It will pick up the wintering party of 16 men now at Showa Base on Ongul Island. When it does so, Japan's present program in the Antarctic, which began in 1956 as part of the International Geophysical Year, will come to an end.

The 4,866-ton ship sailed from Hinode Pier in Tokyo Port after a farewell ceremony attended by Education Minister Masuo Araki and Transportation Minister Noboru Saito.

It is carrying a crew of 96 under Captain Sueichiro Akita and a team of 18 scientists led by Prof. Torao Yoshikawa of Tokyo University.

The Soya is due to reach Antarctic waters around Dec. 29. It will sail via Singapore and Capetown. It is expected to leave the Antarctic around

Feb. 21 and return to Tokyo on April 24.

The Japanese wintering party will be flown out of Showa Base in two helicopters carried by the Soya. A single-engine Cessna 185 will take aerial photographs of the area around Showa Base during this operation.

During the 44,000-kilometer round voyage, the team of scientists aboard will make observations of cosmic rays, terrestrial magnetism, the aurora australis and weather and sea conditions.

After it returns to Japan, the Soya will be put into service as a patrol ship in the north Pacific.

The scientists aboard the Soya took 28 books containing the names of donors who have given monetary contributions for the Antarctic expeditions.

The books will be placed in an urn and buried under the ice at Showa Base.

TOKYO, Oct. 28 (Reuters) —

The 1,452-ton Tokyo Fishery University training vessel Umitaka Maru left here today for a four-month survey of Antarctic waters.

It is carrying a survey team of 11 men headed by Takeharu Kumagori and 43 students from the university.

The ship is scheduled to return to Japan on Mar. 15, 1962.

Off to Antarctic

LONDON (UPI).

The British exploration ship Kista Dan left Southampton for the Antarctic Dec. 3 with nineteen scientists and technicians aboard. The group is to spend two years at bases maintained in Antarctica by the Falkland Islands dependency survey.

The whale that is said to have swallowed Jonah must have been a sperm whale. It is the only whale with a gullet large enough to admit a man.

ARCTIC POSTAL CANCELLATION IS RULED OUT

[Chicago Tribune Press Service]

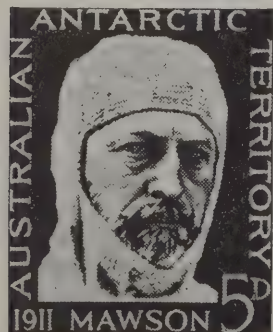
OTTAWA, Sept. 5—Skippers of Canadian government vessels in Arctic waters are being saved from a plague of letters from stamp collectors in the United States and abroad seeking Arctic postal station cancellations.

All such letters are being returned to senders by the post office department with an explanation that officers and crew of the arctic ships are too busy in port to handle hobby mail.

Requests have been received from many countries, some asking that as many as 32 envelopes be mailed on successive days from stops on the northern routes, from Alert to Padloping bay. Philatelist clubs have sent form letters, and some have given detailed instructions, such as "use the handstamp containing the ship's name to apply a clear impression in the left hand corner and autograph the envelope."

Australia Pays Tribute To Sir Douglas Mawson

To commemorate the 50th anniversary of the 1911-1914 Australasian Antarctic Expedition, Australia has issued a new 5-pence stamp. The design of the stamp is based on a hitherto unpublished portrait of the late Sir Douglas Mawson, leader of the expedition. The new gray, green adhesive will be valid for postage in Australia as well as in the Australian Antarctic Territory.



Australia honors Antarctic Expedition.



Commemorating the fiftieth anniversary of Roald Amundsen's arrival at the South Pole, Norway on Nov. 10 issued two stamps, a 45 øre, red with a portrait of the explorer; at



the right, his sailing ship, and a team of sled dogs as background; and a 90 ø, blue, delineating the tent set up at the South Pole and five members of the expeditionary group.

South Pole Letter

Until some astronaut mails the first letter from the moon, the stamp collectors' prize will have to go to August Howard of Long Island, N. Y., for the letter he got the other day.

Not only was it mailed from the South Pole by the famous explorer Paul A. Siple (whose home is 131 N. Jackson st., Arlington) but it was postmarked "Pole Station, Antarctica" twice—with the dates five years apart:

Once was on Dec. 15, 1956, the day the South Pole Post Office opened. The other was on Nov. 4, 1961, when Siple, returning to the Pole for a 10-day visit, mailed it for keeps.

Siple was the scientific leader of the historic polar expedition and the South Pole's first postmaster. He stamped and canceled the envelope in 1956 without mailing it.

Stamp No. 1 (1956) is a 6-cent air mail stamp. By the time Siple returned to Antarctica late last October the rates had gone up. Undismayed, he mailed the letter on to Howard anyway. Stamp No. 2 (1961) is a 7-center.

Other seals, emblems and addenda on the envelope included:

A cachet (insignia) designed by Siple and showing a penguin atop a (South) pole flying the American flag;

Siple's signature;

A cachet of the International Geophysical year;

Three postmarks by Naval way stations in Antarctica for Operation Deep Freeze—one showing an outline of the continent; one showing a sailor holding up the globe Atlas-style with Antarctica on his shoulder; and another showing a penguin silhouetted against three ice cliffs.

Washington Post



AUGUST HOWARD

... with explorer Siple's 5-year-old letter

Stamp From France



December 11 brought a single common in horizontal format for French Antarctic Territory. The design shows a large portrait of Jean Baptiste Etienne Auguste Charcot (1867-1936). He was an explorer who made Antarctic expeditions in 1903-05 and again in 1908-10.

He got as far as Adelaide Island, and saw the then inaccessible coast of Alexander I Land. His ship bore the quaint name "Pourquoi Pas?"

Polar Base, City On Two From Argentina

Argentina's most recent philatelic output consists of two singles released August 19, each of two Pesos value. One in terra cotta and black marked the fourth centenary of the founding of the first city of Jiljuy. The other, black, is for the tenth anniversary of the establishment of the Gen. San Martin Base in the Argentine Antarctic.

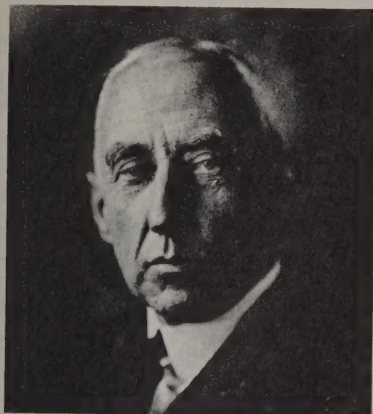


The Polar item depicts a typical Antarctic scene, with two men and a dogsled in the foreground. It was heliogravure printed by the State Mint, quantity three million.

FRIDTJOF NANSEN

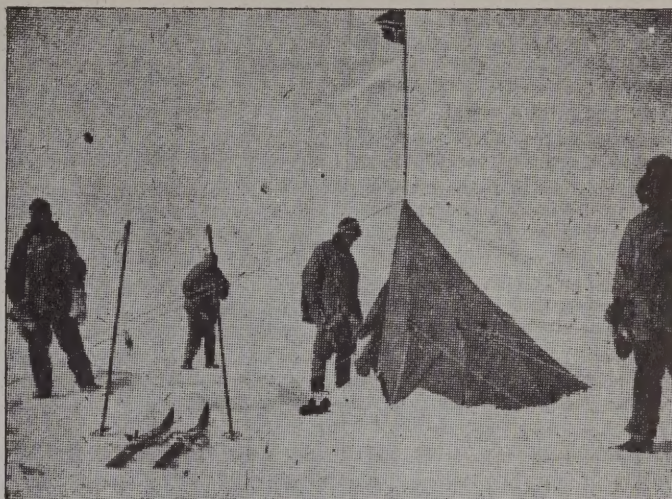
Marking the centenary of the birth of Fridtjof Nansen, explorer of the Arctic, director of several efforts following World War I to aid refugees of that strife, and recipient of the Nobel Peace Prize in 1923, Norway on Oct. 10 released two stamps. The 45 øre, red, and a 90ø, blue, will show a portrait of Nansen, as created by Arne Johnson.





Captain Roald Amundsen,

a great Arctic and Antarctic explorer, was first to reach the South Pole in 1911. He was lost in the Arctic in 1928.



SCOTT AND HIS MEN find Amundsen's tent at the Pole. "Great God! This is an awful place and terrible enough for us to have laboured to it without the reward of priority." From Walter Sullivan's "Quest for a Continent."

Topics

Dec. 14

Way Down South in 1911 At 3 P. M. just fifty years ago today a band of five men stood at the spot which marked

the final point in the geophysical measurement of this spinning globe we live upon. The location of the South Pole by human witnesses was an achievement in persistence, indomitable courage and sheer physical endurance. It also added to man's clear understanding of his home base, the Earth, and at the same time started a whole chain of new mysteries in nature, many of them only now coming into the ken of expert researchers. The spirit of challenge and of friendly competition has spurred the quest for new records and new facts. It was due in part to this excitement of the chase that the men who stood at latitude 90° south on Dec. 14, 1911, with Capt. Roald Amundsen had set out from Norway many months before.

Goal of a Lifelong Dream

The frozen plateau on which the Pole was located had been the most uncrowded place on earth for all preceding centuries, but Amundsen and his party were only thirty days ahead of the next visitor, Capt. Robert Falcon Scott of Great Britain. The real incentive to the Norwegian expedition came, however, not from an English competitor but from an American who did the opposite of what they succeeded in doing. Roald Amundsen grew up with dreams and visions entirely in keeping with the heritage of his Norse forebears; he cherished the notion that he might be the supreme conqueror of ice and snow and wind and cold, the first man to stand at the North Pole.

This hope was in his mind all through two years of medical training, years of naval service and exploration. At the age of 25 he went to the southern seas with a Belgian expedition.

The Directions Reversed

In September, 1909, Amundsen was making careful plans for a trip to North Polar seas in his ship Fram when news was suddenly flashed across the world that Capt. Robert E. Peary of the United States had reached the North Pole in April of that year and come back to tell the tale. The first wave of surprise and disappointment in Roald Amundsen's breast was soon succeeded by a new determination; he quietly resolved that since the North Pole was, so to speak, "occupied," he would tackle the only one left and head south. With his second in command, Lieut. Thorvald Nilsen, he studied new charts and routes; depots, landfalls and marches were worked out. Although he had never been near enough to see the great ice barrier which fenced in the Antarctic, Amundsen was well read in the literature; he knew Captain Cook's story of the first crossing of the Antarctic Circle in 1773 and how Sir James Ross had braved the fearful ice to find open water beyond it in 1819.

Not Unlike a "Pleasure Trip"

The experience of contemporary explorers was familiar to him; he knew of the fierce and variable storms which harassed Sir Ernest Shackleton in 1907-09. Therefore it was with great satisfaction that the Norwegian party found their careful preparations marvelously supplemented with unusually favorable weather conditions just at the time they had scheduled the crucial dash by dog-

sled across the high altitudes of the polar continent. This led the intrepid commander to report later that much of their final trip to the Pole was "in many ways not unlike a pleasure trip." However, he also reported frost and sunburns so severe that all members of the party were disfigured during the extreme exposure of that triumphal march which brought them to the goal right on schedule.

An International Continent

Amundsen lived to be the first navigator to traverse the Northwest Passage from the Atlantic to the Pacific in 1918, a quest that had lured Frobisher and Hudson and a host of others over three centuries. He was the first to fly over the North Pole and he died somewhere in the North Polar regions searching for survivors of the Italian party under Nobile in 1928. But the march to the South Pole set a stage for others to perform new marvels upon; Admiral Richard E. Byrd was the most distinguished and the most successful among numerous parties over the past half-century. More recently Operation Deep Freeze and the International Geophysical Year brought a world congress of scientists to the sixth continent and today a dozen nations are getting ready for the Quiet Sun Year, 1964-65.



Jan. 18

Fifty years ago:

After an 850-mile journey across the Antarctic snowfields, Capt. Robert F. Scott, a British explorer, and four companions, reached the South Pole, only to find there the Norwegian flag, planted five weeks earlier by Roald Amundsen. On his return trip, Scott and his companions died in a blizzard ("I do not regret this journey, which has shown that Englishmen can endure hardships, help one another and meet death with as great fortitude as ever in the past." From Scott's diary, discovered by a search party).

Navy Gets Atomic Generator

WASHINGTON, Oct. 25 (UPI) —The Atomic Energy Commission turned over to the Navy yesterday a small generator fueled by radioactive strontium-90 that will power an automatic weather station in the Antarctic starting early next year. The generator will operate untended for about two years.

ANTARCTIC

Australia on July 5 replaced the 5-pence, brown, overprinted Australian Antarctic Territory stamp, current since 1957, with a new 5p blue stamp of similar design. It shows the three explorers, Edgeworth David, Douglas Mawson and A. F. McKay, the first men to reach the South Magnetic Pole. The be-furred trio is shown standing at the magnetic pole, an Australian flag implanted at the spot, and marking their 1908-09 adventure.

F.E. MEINHOLTZ, 71, OF THE TIMES DIES

Was Communications Head
for Three Decades

Frederick E. Meinholtz, communications engineer who was director of The New York Times communications system for three decades, died Dec. 23 at Terrace Heights Hospital after a long illness. His age was 71.

Mr. Meinholtz lived at 123 Wickham Road, Garden City, L.I. He is survived by his widow, the former Miss Mae Mackall; two sons, Frederick and Harry B. Wheeler, who was adopted; a daughter, Mrs. Lillian Stock, and five grandchildren.

Short-Wave Pioneer

Mr. Meinholtz was a pioneer in the development of short-wave radio news broadcasting. He had been in communications work since 1906 when, at the age of 16, he first became a counter clerk in a Western Union office in his home town of St. Louis.

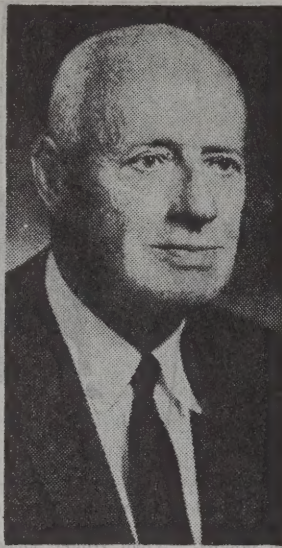
The next year he became office manager for Western Union in that city, a post he held until 1917. He served in the Navy from 1917 until 1919, and he joined the communications department of The Times in 1920. In 1931 he became the department's director and held that position, which at one time included running The New York Times News Service. He was to have retired Dec. 31.

Mr. Meinholtz helped to set up Press Wireless, Inc., in the late Nineteen Twenties, was the transmission agency's secretary between 1932 and 1943 and was one of its directors at his death.

But he was probably best known to the public as an "eavesdropper" because of an incident that happened in 1928—an incident that made a minor sensation in the press at the time and has since been retold countless times, dramatized on radio and reprinted in magazines.

The Times was in direct radio communication with the Byrd Antarctic expedition, with exclusive rights to the Admiral's story. Mr. Meinholtz was at home in Queens on the night of Dec. 12 and, as was his practice, was "eavesdropping" on the messages.

Suddenly there was a break in the dispatch coming in and then this message: "Meinholtz, Hilferty at The Times wants you to hang up your telephone receiver so that he can call you on the telephone." The message had gone more than 21,000 miles to the South Pole and back. He then called the office—eighteen miles away.



The New York Times Studio

Frederick E. Meinholtz

Mr. Meinholtz was the expedition's radio consultant and had devised the short-wave system used by it at a time when the prevailing expert opinion was that direct communication with the Antarctic was not practicable. The Times had the only newsman with the expedition, Russell Owen, and during eighteen months there he missed direct communication with the paper only two days.

During a radio exchange with Mr. Meinholtz in 1929, Admiral Byrd said:

"Thanks to your farsightedness, we have been in daily communication with the outside world, and weekly broadcasts that you arranged for our entertainment have meant more to us and to our families than perhaps you realize."

Three years earlier, Mr. Meinholtz had arranged for The Times to receive the first direct message from an airship flying over the North Pole. That year he also handled the communications for the North Pole expeditions of Admiral Byrd and Roald Amundsen and initiated high-frequency, regularly scheduled news transmissions to ships at sea.

During another radio exchange with Admiral Byrd in 1929, Mr. Meinholtz forecast that some day their communications would include the transmission of photographs of an expedition's operations within minutes of their happening. This came true eleven years later, when The Times received the first such pictures from a tiny 500-watt Antarctic transmitter 12,000 miles away.

He was active in the American Legion, the Veteran Wireless Operators Association and American Polar Society. He was a member of the Garden City Country Club, the Admiral's Club and the Stratoliner Club.

Rear Adm. E. H. Smith Dies, 'Iceberg Ed' of Coast Guard

FALMOUTH, Mass., Oct. 30—Rear Admiral Edward H. Smith, U. S. C. G., retired, onetime director of the Woods Hole Oceanographic Institution, died yesterday at his home on his seventy-second birthday.

Iceberg Authority

An international authority on icebergs and northern waters, Adm. Smith was known as "Iceberg Ed" by many associates who respected both his vast experience and his scholarship. He won an M. A. and a Ph. D. from Harvard for his studies in oceanography and meteorology and his published articles on Arctic ice and ocean currents are considered definitive.

He was born in Vineyard Haven, Mass., the descendant of a long line of whaling men. When he entered Massachusetts Institute of Technology he intended to become a mining engineer but switched to the Coast Guard Academy after a year and was commissioned an ensign in 1913.

Adm. Smith served on escort duty for allied shipping in World War I, making the run between Gibraltar and the British Isles. At war's end he joined the Coast Guard's Ice Patrol. In the ten years that followed he made a thorough study of Arctic ice and currents. His findings won him a fellowship at the Geophysical Institute in Norway. Later he continued his advanced work at Harvard.

In 1928 he was named leader of the special expedition of the Coast Guard Cutter Marion to the Labrador Sea and Baffin Bay, the first attempt to reach the source of the icebergs and trace their long, circuitous paths down into the North Atlantic.

Adm. Smith commanded destroyers and cutters on both coasts and in Alaskan waters during the 1930s and was cited by the Navy Department for his rescue of the crew of the U. S. S. Swallow from Kanaga Island, Alaska, in 1938.

At the outbreak of World War II, Adm. Smith converted a fleet of Boston trawlers into an armed patrol for Arctic waters that helped prevent Germany from establishing itself in Greenland.

In 1943 he became commander of Task Force 24, Atlantic Fleet, a net of ocean weather stations off Newfoundland, Greenland and Iceland to assist military aircraft flying the North Atlantic. The work



Rear Admiral Edward Smith

was so successful that it evolved into an international peacetime service for civil aviation.

In 1945 he was made commander of the Coast Guard's 3d District and Captain of the Port of New York. The following year he was given additional duties as commander of search and rescue operations for the western North Atlantic. He retired in 1950 and was named director of the Woods Hole (Mass.) Oceanographic Institution where he served until 1956.

Surviving are, his wife, Mrs. Isabel Brier Smith, and three sons, Porter H., Stuart E. and Jeremiah Smith.

4 KILLED IN ALASKA IN NAVAL AIR CRASH

KODIAK, Alaska, Oct. 29 (AP)—Four men were killed Friday in the crash of a Navy plane in a lake on Adak Island in the Aleutian chain, the Seventeenth Naval District announced today. The other five aboard received minor injuries.

The twin-engined UF2 amphibian was making an aerial survey of Andrew Lake, four miles north of the Adak Naval Station.

Those killed were John L. Wedster, Louisville, Ky., Helma H. Gray, Jefferson City, Tenn., and Donald E. Paul, Beatrice, Neb., Navy, and Doyle Cisney, Alaska Department of Fish and Game.

The plane, based at Adak, broke in two when it hit the water. The survivors managed to inflate a raft.

JOHN BORDEN, 78, FINANCIER, DEAD

Founder of Yellow Cab in
Chicago Was an Explorer

SPRING LAKE, Mich., July 29 (UPI)—John Borden, explorer and financier, died in his sleep Saturday after a paralytic stroke. He was 78 years old.

Mr. Borden graduated in 1906 from Yale University, where he was elected to Phi Beta Kappa and was captain of the Yale gun team.

Two years later he received a degree from the Northwestern University Law School and was admitted to the Illinois bar. He gave up his legal career to organize the Yellow Cab Companies of Chicago, which he later sold for several million dollars.

In 1915 Mr. Borden joined the French Army as an ambulance driver. He later won the Navy Cross while serving as a lieutenant commander in the United States Navy.

Early in the century he skippered the auxiliary schooner Northern Light on an expedition of the Arctic coast of Siberia for Chicago's Field Museum of Natural History. He also led a similar expedition to the Bering Sea for the American Museum of Natural History in New York. Later he was first mate aboard the schooner Great Bear when it sank during an expedition to the Bering Sea and he helped to rescue other survivors.

POLAR HERO HONORED

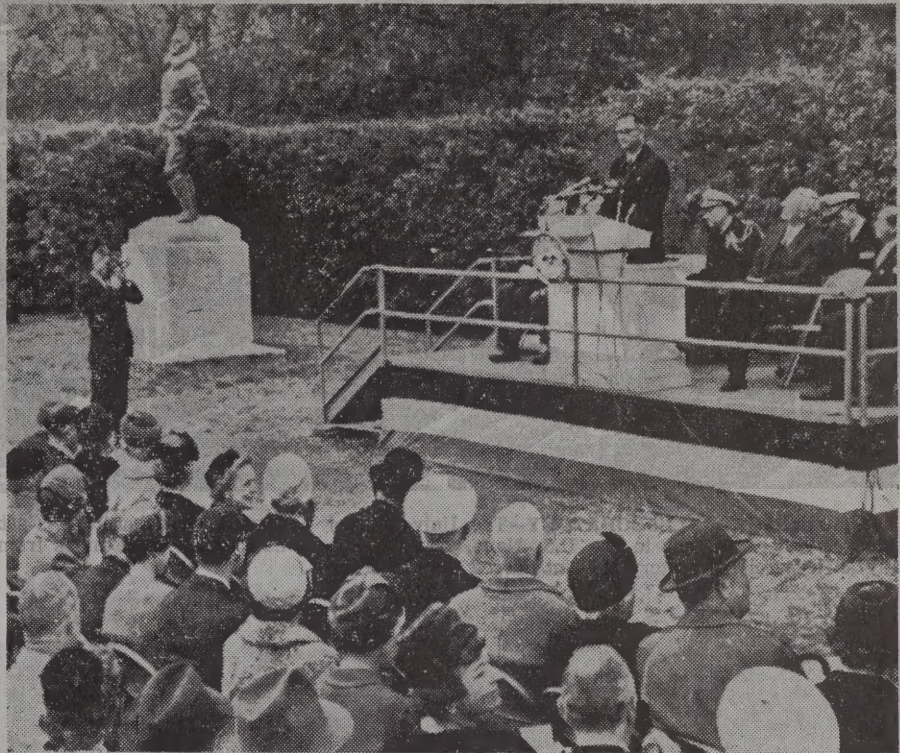
Maryland Unveils Plaque to
Matthew Henson, a Negro

ANNAPOLIS, Md., Nov. 18 (AP)—Gov. J. Millard Tawes described Matthew A. Henson, co-discoverer of the North Pole, today as "a great Marylander, a great American, a great human being."

The Governor's remarks were made at a ceremony unveiling a memorial plaque in honor of Mr. Henson, a Negro, in the Maryland State House here.

"As we gather here this morning to unveil this memorial to Matthew Alexander Henson, I have the feeling, as I suspect many of you have, that we are giving past due recognition to one of the noble heroes of a state whose glorious history is filled with the deeds of heroes," Mr. Tawes said.

Mr. Henson, born on a Charles County farm, reached the North Pole with Admiral Robert Edwin Peary on April 6, 1909. Mr. Henson died in New York March 9, 1955.



Vice President Johnson speaking at the dedication of the statue to Admiral Richard E. Byrd near Arlington National Cemetery. Statue is work of Felix de Weldon.

STATUE DEDICATED TO ADMIRAL BYRD

WASHINGTON, Nov. 13 (UPI)—Vice President Johnson praised the late Rear Admiral Richard E. Byrd today for having uncovered snow-bound secrets in a region "less known than the sunlit side of the moon."

The Vice President dedicated a memorial to the admiral, calling him the "greatest explorer of the air age."

The bronze statue of Admiral Byrd, the first man to fly over both Poles, stands near the main approach to Arlington National Cemetery.

Navy Secretary John B. Connally Jr. announced that a new guided-missile destroyer would be named for the admiral in February.

"This destroyer will remind all nations of the pride that the United States holds for one of its most distinguished citizens," the Secretary said.

Mr. Johnson recalled that Admiral Byrd and his expeditions had "charted unknown mountain ranges, vast glacial expanses and frozen seas." He also termed the admiral a humanist, who, although trained as a fighting man, had been saddened by international strife.

Admiral Byrd "served with selfless energy on numerous committees working for world peace and the extension of the democratic ideal," he said.

MACMILLAN CLEMENTS

Construction Figure, 52, Dies
—Held Many Patents

NANTUCKET, Mass., Aug. 23 (AP)—Macmillan Clements, an internationally known construction figure, died today in Nantucket Cottage Hospital. He was 52 years old.

Mr. Clements held thirty-five patents in the construction business, including one for laminating stainless steel and aluminum to plywood. This patent was used when he supervised construction of Thule Air Base in Greenland in World War II.

Mr. Clements supplied the construction equipment for buildings for the scientific Operation Deepfreeze in the Antarctic.

He retired two years ago as president of the Clements Panel Company of Danbury, Conn. The plant closed with his retirement.

Surviving are his widow, the former Elizabeth Miller; a daughter, Elizabeth Ann, and a son, Robert.

Fridtjof Nansen Honored

The governors of sixteen states have issued special proclamations to commemorate the centennial of the birth of Fridtjof Nansen, it was reported Nov. 13. The Norwegian explorer, who became League of Nations Commissioner in charge of refugee relief, was born on Oct. 10, 1861.

CARGO PLANE CRASH KILLS SIX IN ALASKA

SHEMYA, Alaska, July 21 (AP)—An Alaska Airlines cargo plane trying to land in fog hit 300 feet short of the runway Friday and piled up in flames, killing all six crew members.

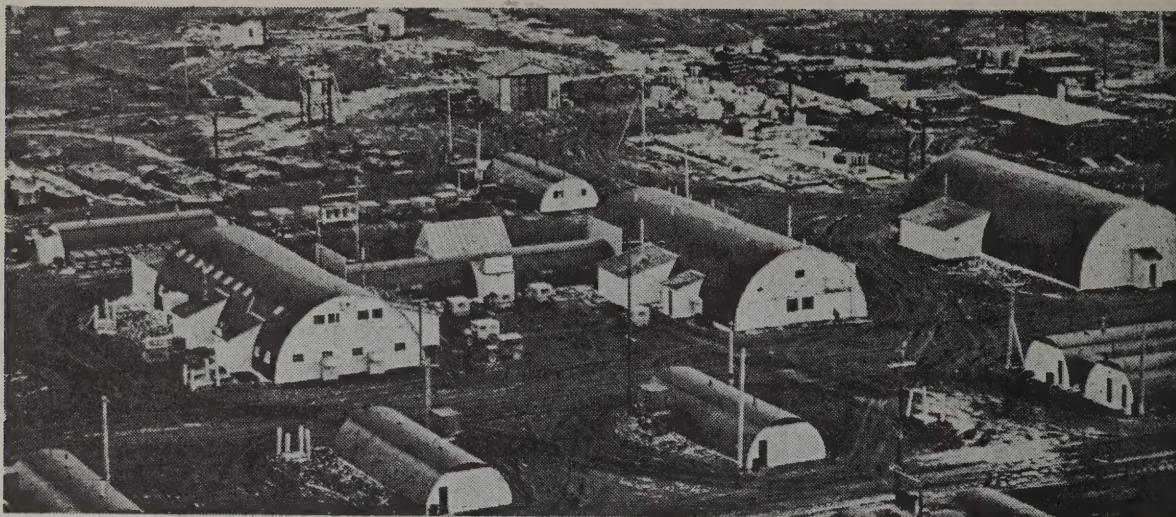
There were no passengers on the military cargo flight.

Visibility was half a mile with a 100-foot ceiling as the transport crashed at this Aleutian Island base, a major refueling stop on the Great Circle airline route.

The DC-6, under contract to the Military Air Transport Service, was bound from Travis Air Force Base, Calif., to Tachikawa Air Force Base near Tokyo.

It had been scheduled for a refueling stop at Shemya, 1,500 miles southwest of Anchorage.

The airline identified the crew members as Capt. Edward Bowman, 44 years old, of Seattle; Capt. Galvin W. Sargent, 41, of Danville, Calif.; the co-pilot, John H. Bird Jr., 29, of Kent, Wash.; a flight engineer, Dwight M. Babcock, 28, of Seattle; a flight engineer, William E. Donovan, 26, of Seattle, and the navigator, Edson A. Marrahrens, 41, of Bellevue, Wash.



ARCTIC RESEARCH LABORATORY—The University of Alaska, under contract to the U.S. Navy, operates the Arctic Research Laboratory at Point Barrow, on the Arctic

Coast. The laboratory is set up in this group of quonset huts, about three miles from Barrow village.

—Photo by William W. Bacon III



THE OLD WAY—Pribilof Island natives lighter in freight from the vessel Penguin (in the distance) in an oomiak, a skin-covered boat, in the manner of their ancestors.

The Pribilofs are the location of seal rookeries in the Bering Sea. The seal harvest is administered by the United State Department of the Interior.

—Mac's Foto, Anchorage